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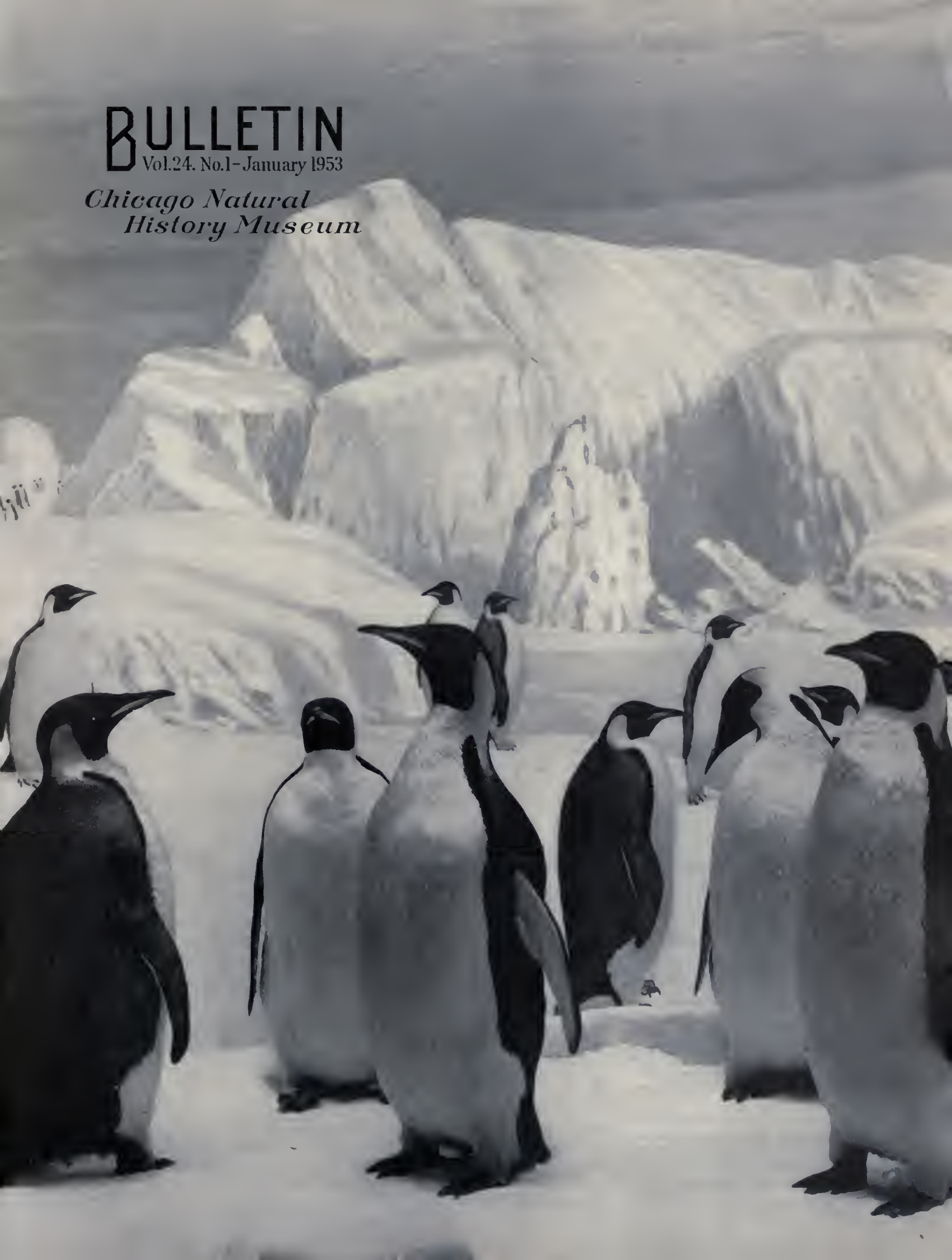

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Members are requested to inform the Museum promptly of changes of address.

WALTHER BUCHEN ELECTED TO BOARD OF TRUSTEES

Walther Buchen, prominent Chicago advertising executive and founder of The Buchen Company, was elected a member of the Museum's Board of Trustees at a meeting held December 15. Mr. Buchen fills the vacancy caused by the recent death of Leopold E. Block.

Walther Buchen

Mr. Buchen, well-known for his hunting of big game in Africa, has long been interested in the activities of the Museum. He has contributed to the Department of Zoology large collections of African animals, particularly birds, obtained on two expeditions in recent years. In the summer of 1952 he sponsored and led an expedition to East Africa especially for Chicago Natural History Museum.

Mr. Buchen, who was born in Theresa, Wisconsin, began his adult life as a member of the faculty of the University of Illinois, after earning a Master of Arts degree there. In 1915 he entered advertising and rose to important executive positions with agencies in Chicago and St. Louis. In 1923 he founded The Buchen Company, of which he is president. He is a resident of Winnetka, Illinois.

TWO STAFF VETERANS RETIRE; OTHER CHANGES

A number of changes in the staff of the Museum—retirements, transfers, new appointments, and resignations, effective from January 1—have been announced by Colonel Clifford C. Gregg, Director. Details of the most important follow:

Dr. Wilfrid D. Hambly, Curator of African Ethnology at the Museum for the past twenty-six years, retired on December 31. Dr. Hambly's career in the Department of Anthropology has been marked by notable achievements. In 1929–30 he was leader of the Frederick H. Rawson West African Expedition, in the course of which he explored vast areas of Angola (Portuguese West Africa) and Nigeria. The comprehensive collections that he brought back, representing many tribes of both countries, form a large part of the exhibits in the Hall of African Ethnology (Hall D).

Wilfrid D. Hambly

Dr. Hambly supervised the installation of the exhibits in Hall D, as well as supplementary African exhibits in Hall E and Australian exhibits in Hall A-1. He has been responsible for much scholarly research in the African field and also in craniometry and is the author of a number of scientific publications of the Museum. In addition, he has written many popular books for both children and adults.

Born in Clayton, Yorkshire, England, Dr. Hambly, after graduating from Hartley College became a schoolteacher. In 1913 he was a member of the Anglo-Egyptian Sudan Archaeological Expedition for the Wellcome Historical Museum of London. When the first World War began in 1914, he enlisted in the British Royal Naval Division, a service similar to the United States Marines, and fought at Gallipoli and in France.

Following the war he was a lecturer in biology at Eastham Technical College and a research worker for the Industrial Research Board in London. Dr. Hambly came to the United States in 1926 and joined the staff of this Museum at that time. During his years at the Museum he became an American citizen and was awarded the degree of Doctor of Science by Oxford University for his African research.

Milton D. Copulos, for many years an artist-preparator in the plant reproduction laboratories of the Museum's Department of Botany, retired on December 31. Mr. Copulos came to the Museum in 1910 after a career as a commercial artist, becoming the first of the technicians engaged in the preparation of lifelike reproductions of plants of the world for the exhibits now housed in Martin A. and Carrie Ryerson Hall (Plant Life, Hall 29). In 1914 Mr. Copulos left the employ of the Museum for a period of years, working at the Wistar Institute of Anatomy in Philadelphia and at the American Museum of Natural History in New York. He returned to Chicago Natural History Museum

Milton D. Copulos

(*Continued on page 6, column 1*)

THIS MONTH'S COVER

The emperor penguin in its antarctic home, as shown in a habitat group in one of the Museum's halls of birds (Hall 20), appears on our cover. The specimens in this group were collected by Rear-Admiral Richard E. Byrd in "Little America" for the Brookfield Zoo and were presented to the Museum by the Chicago Zoological Society.

Something About Penguins

The penguin of reality is hardly less strange than the penguin of fancy and fiction. Penguins, of about seventeen species, are flightless birds of southern, mostly antarctic, oceans. They swim with flipper-like wings. One species has an estimated 3,800 tiny feathers on the top of its forearm; one species holds its single egg on its feet while it incubates; the young of another species are gathered into community groups under the care of a few adults; and another species gets transportation in migration by sitting on drifting ice cakes and sits, fasting, on the ice, during its twenty-day molt. One species has certain places where its individuals go to die.

The upright pose, apparent shortsightedness, pompous dignity, and black-and-white evening-dress effect, suggesting human beings, have resulted in penguin toys, penguins in advertisements shown smoking cigarettes and reading books, and, most famous of all, the penguins baptized in error by St. Mael on Anatole France's *Penguin Island.*

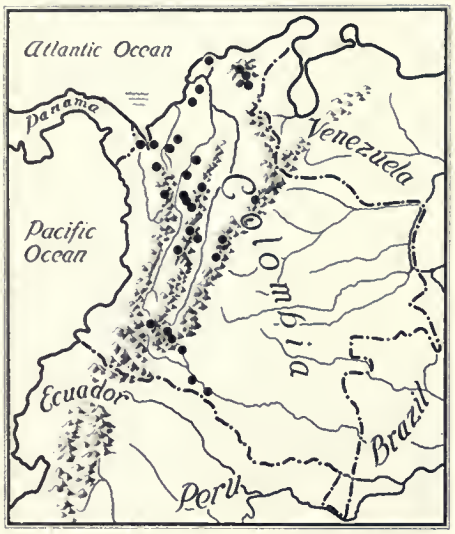
AUSTIN L. RAND
Curator of Birds

FOUR YEARS ON A ZOOLOGICAL EXPEDITION IN COLOMBIA

By PHILIP HERSHKOVITZ
ASSISTANT CURATOR OF MAMMALS

THE COLOMBIAN Zoological Expedition, with personnel of one, the writer, left Chicago on November 22, 1948, and arrived in Barranquilla, Colombia, the next day after a stopover in Miami to change planes. It returned to Chicago on September 16, 1952, by the same route.

The Colombian Zoological Expedition, which was in the field for three years and ten months, is one of the longest continuous collecting expeditions in the history of the



AREA WORKED BY EXPEDITION

Colombia, intercontinental crossroads of South America, where Philip Hershkovitz, Assistant Curator, spent almost four years on an expedition for the Museum. Collecting areas in which he did his principal work are indicated by dots.

Museum and the longest of the Department of Zoology. The main objective was to study and collect Colombian mammals as part of the Museum's long-range South American zoological program. It was planned to cover as much territory as possible in an attempt to secure a highly varied representation of the fauna. Previously, there was but a handful of specimens of Colombian mammals in the Museum. As a result of the expedition, our collection of Colombian mammals was increased by nearly 4,000 specimens representing about 1,000 species and subspecies. It is now the largest and most representative in the world.

Even this material is only a surface scratching. Colombia remains less known zoologically than any other comparable area in the world in spite of the fact that it is just as conveniently accessible today to human travel as it was to animals back in geological time when it was the crossroad for intercontinental exchange of faunas. Nevertheless, we do know that Colombia's faunal wealth is unrivaled. It has already been shown that its bird fauna is the richest in the world, comparing area for area. Its mammalian fauna may prove to be even more varied. One result of the expedition is proof that Colombia, though only about one-twentieth the size of all North America, has at least one-half as many kinds of mammals. And no wonder! Colombia connects the two American continents, it faces both the Atlantic and Pacific Oceans, and it borders on Panama, Venezuela, Ecuador, Peru, and Brazil, sharing their faunas.

ALL-EMBRACING VARIETY

Within Colombia's territorial limits are found all the world's climates and nearly all the major geographic regions and biophysical zones of South America. The country is composed of the northern limits of the Andes, longest and second highest mountain chain in the world; a vast piece of Amazonian jungle drained by the mightiest river in the world; the largest share of the South American *llanos* or plains comparable to our prairies or to the Argentine pampas; the semi-arid Caribbean coast and the desert of the Goajira Peninsula; the humid and forested Pacific Plain and Piedmont, a portion of the basin of the Maracaibo, which is South America's largest lake; and far-flung bits in isolated mountains or "lost worlds" of the original Guiana highlands. Any physical part of a major South American geographical region not represented in Colombia is made up for by distinct but fully comparable features together with others that are strictly its own, such as the lofty, isolated mountain mass known as the Sierra Nevada de Santa Marta whose highest peak, San Cristóbal, towers nearly 20,000 feet above sea level.

EPICUREAN SIDE TO COLLECTING

Hunting and trapping mammals is arduous, time-consuming, and, as often as not, little or not at all rewarding. When the chief concern is the collection of mammals, the taking of other kinds of scientific specimens, not specifically requested by a colleague, becomes purely incidental because so little time and energy is left for extra work. The interest in game birds of the late Boardman Conover, long-time Trustee of the Museum, combined with my interest in eating them, resulted in a collection of skins of most of the Colombian species of tinamous, curassows, guans, chachalacas, and quail. A good many of my turtle dinners are commemorated by the victims' shells, duly numbered and catalogued, in the Museum study collection. Many rare, and some new, frogs and lizards were among specimens picked up and kept as consolation prizes for returning to camp without any mammals after a long night hunt with jacklight.

Very often birds, lizards, snakes, and frogs are caught in traps set for furred animals, and are then preserved, if circumstances permit. All animals have parasites and there was no shortage of fleas, lice, mites, ticks, etc., on mammals shot or trapped. Rupert Wenzel, Curator of Insects, reports that my collection of external parasites includes many new to science. He is especially enthusiastic about a parasitic fly belonging to a group heretofore known only from the Old World. It is the most primitive type in its group and, strangely, was found on the most specialized species of bats.

It is but fair to record, at this point, one anomalous case where the capture of mammals was incidental to botanizing. In poking about palm groves to get a certain kind of palm for Dr. B. E. Dahlgren, Curator Emeritus of our Department of Botany, I discovered, in the tree selected, a very rare arboreal spiny rat that was previously known only from the first specimen sent from Colombia a century and a quarter ago.

ENCOUNTERS MILITARY ACTION

Unsettled political conditions and official censorship in Colombia made travel in general difficult and a planned itinerary impossible. In some cases I was able to complete collecting and leave a region just before the

PART OF A NIGHT'S CATCH

The long-tailed teddybear-like animals displayed by one of Assistant Curator Hershkovitz's native helpers represent the rarest of American carnivores. This is the first published photograph of the species, which is called bassaricyon. It is a relative of the racoon. Also shown is a weasel of the same species common in North America.

insurgents moved in. In other instances, however, after considerable preparation and expense, I would reach a desirable locality only to be turned back by police because of military action in the area. One kind of frustrating travel experience was my arrival

at a village where, I had been assured by the regional commander, everything was tranquil and perfectly safe. I found the village perfectly safe indeed—it had been converted into a garrison! But the countryside, where I should have to make camp as center of collecting operations, was swarming with guerrillas. I preferred not to expose to theft or confiscation my precious and largely irreplacable collecting supplies and equipment, and so I left the region entirely to plan another trip elsewhere.

The expedition had three main gravitational centers of operations. The first in Barranquilla, on the Caribbean coast, just above the mouth of the Magdalena River, was the center for receiving mail, storing equipment and collections, and purchasing principal supplies during 1949. That year collecting was done in the departments of Bolívar, Córdoba, and Magdalena where no systematic collections of mammals had ever been made before. The 1950 center was Medellín, provincial capital of the Department of Antioquia, in a valley of the western chain of the Andes at 5,000 feet above sea level. During 1950 and the early part of 1951 a number of stations ranging in altitude from sea level along the gulf of Urabá to 16,000 feet on Mount Ruiz, in the departments of Antioquia, Caldas, Tolima, and Chocó, were worked. The capital of Colombia, Bogotá, 8,640 feet above sea level, in the eastern chain of the Andes, was base for the remainder of 1951 and in 1952 until I left the country. Collecting during this last period was done in the headwaters of the Magdalena River, the Amazonian divisions of Caquetá and Putumayo, and around Bogotá itself, in the departments of Cundinamarca and Boyacá.

EXPEDITION CAMP IN A RAIN FOREST

The site is in the Andes of southern Colombia, at about 7,500 feet above sea level. It is on the Central Cordillera alongside the Magdalena River where the stream is barely 50 feet wide. The forest in the background, on the opposite side of the stream, is on the geologically distinct Eastern Cordillera.

Contrary to what may be the popular notion, there are relatively few species of mammals unknown to science. It is almost certain that no species larger than a common rabbit still remains outside our catalogues. In Colombia, only among bats and very small rodents and marsupials may we expect to find complete novelties. The rare mammals are those known only from one or a few specimens and Colombia has rare animals galore. This factor makes collecting in Colombia a very satisfying experience. It is particularly gratifying to have sufficient time in the field for getting enough specimens to take the animal out of the class of rarities. Indeed, the reason for repeated collecting in the same places year after year, decade after decade, century after century, is not only to get specimens and information missed the last time but also to change the status of species from rare to common in our collections, thus permitting their proper study and classification.

Colombia's highly varied topography and its great number of strongly contrasted major geographic features add zest to collecting and studying the country's fauna. Great river basins like that of the Orinoco and the Amazon have many kinds of animals found in the one but not in the other. The north-south running ranges of the Andes mark off animals on the eastern side of the mountains that are different from those of the western. Most of the animals found at the base of the mountain chains are unlike those of their summits. Even one bank of a not necessarily wide or specially long river may hold a large population of a conspicuous animal, like a fair-sized monkey, that is entirely absent from the other bank and all the territory beyond.

To be sure, there are many species whose distribution is widespread and not affected by such physical barriers. Yet among these there are animals that respond to isolating factors in such manners that it becomes difficult to determine just what kind they are. These representatives of what proves to be the same species living on opposite sides of the river or the mountain chain may be so different in coloring, markings, or size as to appear to be unrelated. Large series of specimens from all localities, however, very readily show whether they are variable elements of the same form or are really different species.

The Colombian material now assembled in the Museum with the additional specimens acquired from time to time will constitute the indispensable basis for revising our knowledge of the origin, distribution, and intercontinental relationship of the animals of the Western Hemisphere.

Like almost all Latin Americans, Colombians give courteous treatment to well-behaved foreigners. Scholars from all lands are warmly received by their Colombian colleagues and well attended by government officials. In spite of the civil war that raged during the whole of my stay in Colombia and the suspicions that my field activities, especially the night hunting, must have aroused at times, I was never unnecessarily molested, never seriously hindered, and generally always helped in meeting my responsibilities and fulfilling my mission for, as every one in Colombia explained it, *el bien del pais*—the good of the country.

DALLWIG LECTURE TOPIC: 'LIFE—WHAT IS IT?'

In his Sunday afternoon lectures at the Museum during January, Paul G. Dallwig, the Layman Lecturer, will discuss "Life—What Is It?" He will attempt answers, based on the most reliable scientific data thus far available, to such questions as: "How did life start?" "Where did it start?" "Is it electricity?" He will also discuss reproductive processes of plants, animals, and human beings. The same lecture will be given on each Sunday afternoon of the month—January 4, 11, 18, and 25.

During February, Mr. Dallwig will not appear at the Museum because of an out-of-town lecture tour.

Members of the Museum may use their membership cards to attend these lectures without advance reservations. All others, with the exception of accredited representatives of the press, must make reservations in advance. Reservations may be made by mail or telephone (WAbash 2-9410). The lectures are free. They start promptly at 2 P.M. and end at 4:30 P.M., including a half-hour intermission for relaxation or for tea or coffee in the Museum cafeteria, where smoking is permitted. Admission is restricted to adults.

IF YOU'RE COLD, TRY ESKIMO METHODS OF KEEPING WARM

By CHRISTINE TARDY
BULLETIN STAFF WRITER

WE, IN THE MIDST of the most advanced technical development on earth, have adequate shelters for protection from cold weather and haven't had to rely mainly on clothing. The Eskimos, on the other hand, do not have our technology and have had to depend primarily on clothing for protection. So they have evolved some highly efficient warm clothing, based on principles we could well apply when we leave our warm shelters and go out in bad weather.

COUTURE MOTIF BY AN EXPLORER

For extreme cold, the famous Arctic authority, Vilhjalmur Stefansson, recommended an outfit that drew upon the best ideas of many Eskimo tribes. Over underwear of caribou with the fur facing the skin, the model puts on identical garments for outer wear—trousers, parka, boots, and mittens—but with the fur facing out. The outer garments shown here are of seal. The model in this and other pictures on this page is Miss Nancy Worsham of the Raymond Foundation staff.

In learning how to buck the cold, it's important to understand some of the peculiar properties of cold air and their effects on you. Cold air is dry air because the moisture in it freezes and falls to the ground.

BEWARE OF OVER-DRESSING

This immediate freezing of moisture in extreme cold, although it produces a few desirable conditions, is more notable for its many disadvantages. Probably more people have frozen to death because they did not understand the dangers of moisture than for any other reason. It is, in fact, possible to freeze to death by being clothed too warmly! The trouble in this comes when you start perspiring, because, unless the moisture can escape, it will soak into your apparel and clothe you in ice.

Steam issuing from the mouth, nose, and eyes can be a menace, too. It is dangerous for a man in extreme cold to be anything but clean-shaven at all times, because steam from his breath will condense as frost on the face. Unless he can place a warm hand against his freezing face from time to time, frostbite might set in. If a beard is in the way, the hand will freeze before it has defrosted the beard enough to warm the face. The same holds true for most fur-pieces around the face. Eskimos frequently use fur around the hood of the parka, but it is kept well away from the face, unless it is wolverine fur, which will not accumulate frost.

LESSON IN ESKIMO ECONOMICS

The Eskimo husband hunts the animals used for his wife's fur coat and his own. The wife prepares the skins and furs and tailors the complete outfits for both. The sealskin mittens worn by the model are made with thumbs on both sides. When the palm side freezes and becomes stiff the mittens are reversed, so the soft palm may be used while the other side thaws.

Vapor collects on sunglasses, too, and this creates a serious problem in the prevention of snowblindness. Eskimos protect their eyes by wearing strips of wood with small slits cut through, and these do not collect condensing vapor as readily as glass.

SAFETY IN LAYER OF AIR

The most important thing you can know about air (for protection in cold weather) is that it is a nonconductor of body heat. Therefore, you should try to coat yourself with a layer of air—and this can be done. Eskimo winter garb, using the air-insulation principle, affords the best cold-weather protection known. The outfit depends for its effectiveness on two things: materials and design.

The clothing discussed here is based on Vilhjalmur Stefansson's recommendations for Arctic use, drawn from the ideas of a number of Eskimo peoples, and not all Eskimos dress in the manner to be described. Stefansson's ideal winter outfit weighs less than ten pounds, and every part of it except the boots is as pliable as velvet, made from the lightly furred skin of the wild reindeer or caribou. A typical Eskimo outfit that is comfortable at 50 degrees below zero consists of undergarments made from caribou fawnskin—socks, pants, shirt, and mittens—with the fur side next to the body. Over this go garments of caribou yearling—trousers, coat, boots, and mittens—with the fur side facing out except for soles of boots and mitten palms. Caribou is best because the fur consists of hollow hairs. An outfit like this makes use of air insulation in two ways—there is a blanket of air between the two layers of clothing, and each layer of clothing has air trapped in the hollow hairs of the fur.

HUDSON BAY STYLE

No two Eskimo tribes dress quite alike. The model wears a caribou parka of an Eskimo woman of northeastern Canada. For warmth, the fur side faces inward. The outer leather acts as a protection against the wind, while the inner fur holds a layer of air that keeps body heat from being dissipated. There is a hood hanging down the back large enough for carrying a baby.

Such an outfit is not available to us, of course, but there is a material embodying the same principle that can be obtained here—down. "As warm as an eiderdown quilt" is a common simile, and with good reason, for

(*Continued on page 7, column 1*)

STAFF CHANGES—

(*Continued from page 2*)

(then Field Museum) in 1930 and has been here continuously ever since.

Mr. Copulos was born in Verria, Greece, and came to the United States in 1901. He is a graduate of the School of Applied Art, Battle Creek, Michigan.

RESIGNATIONS AND APPOINTMENTS

Dr. Alexander Spoehr, Curator of Oceanic Ethnology, will assume his new duties as director of the Bernice P. Bishop Museum of Honolulu on January 1, 1953. He has been appointed to succeed the late Sir Peter Buck as director of that important museum, which specializes in scientific research in the Pacific area.

Alexander Spoehr

Dr. Spoehr obtained his university education at both Stanford University and the University of Chicago, receiving his Ph.D. in anthropology from Chicago in 1940. Since that year he has been a member of the anthropology staff of Chicago Natural History Museum. At first he specialized in American Indian ethnology, but his interests later turned to the Pacific islands. In 1947 he conducted an expedition to the Marshall Islands for the Museum, and in 1949–50 he led a second Museum expedition to the Mariana Islands. His scientific writings include monographs and papers on American Indian and Pacific archaeology and ethnology, the more important of which have appeared in the scientific series of this Museum.

Dr. Spoehr is chairman of the National Research Council's Subcommiteee on Pacific Archaeology, scientific consultant to the Pacific Science Board, and an editor of the *American Anthropologist*. In 1952 he received a Guggenheim Fellowship to further his ethnological work in Micronesia.

During World War II, Dr. Spoehr was on leave from the Museum to serve as a lieutenant in the United States Naval Reserve and saw duty in the Central Pacific.

Dr. Hugh C. Cutler, Curator of Economic Botany, has resigned from the staff of the Museum, effective December 31. In January he will assume the position of Curator of Useful Plants at the Missouri Botanical Garden in St. Louis. During his five and one-half years with this Museum, Curator Cutler specialized in research on the origin and development of useful plants. He conducted or took part in Museum expeditions to Cuba, Peru, and the Southwest.

Miss Dolla Cox, who has been secretary of the Department of Botany for several months past, has been transferred to the James Nelson and Anna Louise Raymond Foundation where she will be a staff lecturer, replacing Mrs. Anne Stromquist, who has resigned. Miss Cox will specialize in lectures on geology subjects. She majored in that science at Barnard College (Columbia University), of which she is a graduate. Miss Virginia Sharp, a graduate of Iowa State University, where she majored in horticulture, has been appointed secretary of the Department of Botany.

Luis de la Torre has been appointed Associate in the Division of Mammals, where he will continue his taxonomic and distributional studies of the mammals of Guatemala. The mammals of that country have never been comprehensively studied, and he is well fitted to carry on this important work at the Museum.

Mr. de la Torre, born in Madrid, Spain, entered the University of Michigan in 1942 and specialized in the study of mammalogy. During the summers of 1946 and 1947 he was a temporary assistant at the Museum in the Division of Mammals.

Miss Bertha M. Parker, a teacher of science in the intermediate and high-school grades of the Laboratory School at the University of Chicago, has been appointed to an honorary post on the staff of this Museum as Research Associate in the Department of the N. W. Harris Public School Extension. Miss Parker is the author of many books and pamphlets on science for children and also of science-education books for teachers.

Miss Lillian A. Ross, Associate Editor of Scientific Publications, has been appointed Associate in the Division of Insects of the Department of Zoology in recognition of her interest and accomplishment in the study of spiders.

REPORT ON FOSSIL FAUNA OF AUSTRIAN ALPS

By RAINER ZANGERL

CURATOR OF FOSSIL REPTILES

Western Austria is a country of steep and spectacular mountains, belonging to the eastern sector of the central Alps, which extend from the Riviera through Switzerland to the region south of Vienna. A deep valley, the Klostertal, runs from the famous Arlberg divide westward to the Upper Rhine and marks, unmistakably even for the layman, the junction of two major systems of alpine rocks. North of the Klostertal are the jagged cliffs and peaks of the northern limestone Alps; south of this valley are the more gentle forms of the crystalline central massive composed of granites, shists and gneisses (metamorphic rocks).

The northern limestone Alps in this area consist primarily of rocks formed during the geological middle age of the earth, the Mesozoic Era, some 200 million to 75 million years ago.

Facing the Klostertal are wildly eroded, spectacular, vertical cliffs of limestone and dolomite many hundreds of feet high. These rocks were deposited at the bottom of a shallow sea during Triassic time, about 180 million years ago.

Such were the geographic and geologic settings of the exploratory paleontological field work carried on for several months last year by the writer. Vertebrate fossils are usually quite rare in formations such as these, but a number of skeletons of reptiles have been found in avalanche tracks and brook beds. One of these, an essentially complete skeleton of a small marine reptile, was first noted on the exposed surface of a large slab of shale by a young lad who, at the time, thought that it looked like the bones of a lizard. He did not, of course, realize the full meaning of the discovery until many years later when he read an account of fossils in a Sunday newspaper supplement. This reminded him of his early boyhood observation, and he went back to take another look. To his great delight, Albert Schwald found his specimen exactly as he had remembered it and he excavated it with the greatest care. The specimen is now in the collection of the University of Munich where it was studied.

Rocks of similar age and character along the southern fringe of the Alps have produced a magnificent fauna of vertebrate fossils, and it seemed worth while to explore the possibilities in the northern limestone Alps. Fossils were known to occur in black shales along the Klostertal, but no one knew how rich this occurrence might be. In order to gain some idea, I quarried out a considerable amount of shale at a convenient place near Mr. Schwald's farm and close to the spot where he had found the skeleton of *Rhaticonia rothpletzi*.

Bones were found in three fossil levels. In the rather restricted area of the quarry, there was unfortunately no complete skeleton, but isolated bones of several different animals were found, and I have little doubt but that entire skeletons could be obtained by large-scale operations. The frequency of occurrence of the isolated bones per cubic yard of rock is far smaller, however, than in the southern Alps—so small, in fact, that systematic excavation would not produce results commensurate with the effort and the cost involved.

Daily Guide-Lectures

Free guide-lecture tours are offered at 2 P.M. daily except Sundays under the title "Highlights of the Exhibits." These tours are designed to give a general idea of the entire Museum and its scope of activities.

Special tours on subjects within the range of the Museum exhibits are available Mondays through Fridays for parties of ten or more persons. Requests for such service must be made at least one week in advance.

Although there are no tours on Sundays, the Museum is open from 9 A.M. to 5 P.M. (4 P.M. on weekdays).

HOW ESKIMOS KEEP WARM—

(*Continued from page 5*)

down, like caribou fur, consists of hollow fibers that are filled with air, and there is nothing warmer than a properly designed down-filled garment. In weighing less, down has an advantage over caribou, and warmth-for-weight is an important criterion in judging materials to be actively worn in cold weather. Insulation from cold by means of an air layer has the additional advantage of adjusting to the temperature outside, so that no matter what the weather, provided it's below freezing, you are likely to feel just right.

SOME NOTES ON FURS

Because we all have to invest in winter coats from time to time, it might be well to examine other materials, mainly furs. Since it is not the custom here for men to wear fur coats, this will mainly be of use to women (the men will be better off financially by purchasing down-filled coats). Arctic animals are likely to have warmer pelts than others because they need them; so we will discuss those furs used from time to time by the Eskimos. Although some of the furs are not desirable or available to us, nonetheless a total accounting will give an idea of the abundance of life the Eskimo can draw upon.

Polar-bear fur is not warm for its weight, but it is extremely strong and durable, it sheds snow, and it is fairly waterproof, and so Eskimos make trousers from it for unusually rough use. Mountain-sheep wool is probably even warmer for its weight than caribou, but it is not as durable and it holds snow.

Of polar furs available to us, we will not consider otter, marten, and mink because they are too costly for most pocketbooks. Of the many others, fox, used sometimes in coats or shirts by the Eskimos, is warm for its weight and it outlasts caribou, but the skin is fragile and the hair mats with wetting and gathers snow badly. Wolf has the same objectionable characteristics but is stronger than fox. Wolverine, used by the Eskimos for trimming on hoods and cuffs because it does not collect frost, is rare, but otherwise it is about as good as domestic dog.

Beaver is fine for a coat. If unplucked, it keeps snow from caking and sheds rain somewhat. While not warm for its weight, it wears well. Muskrat is not as warm as beaver per coat, but is probably warmer for its weight. Squirrel is about the same as muskrat. Rabbit possesses high warmth-for-weight but is too fragile for practical use.

Of the seals, hair seal is not warm for its weight, but it is strong and water-snow resistant. Fur seal has about the same qualities to recommend it as beaver, provided it is used unplucked, too. Domestic sheep (mouton), not native to the Arctic but used extensively there now, is inexpensive, durable, and grease-resistant (this is important, as you'll see later), but not as warm for its weight as caribou.

DESIGN IS IMPORTANT

Even with the warmest material in the world, design is equally important as a keep-warm factor. Because overheating creates such serious problems, the design of a garment must permit you to *release* excess heat and moisture as well as keep it in. Here the important fact to work with is that cold air is heavier than warm. The Eskimo parka is a one-piece jacket, about fingertip length, and has an attached hood. There are cords at the wrists and the neck, and a belt is sometimes worn at the waist. If you want to keep in all warmth and moisture, you pull these cords tight. But when you get too warm, you might first loosen the belt at the waist, permitting some of the accumulated moisture from your body to escape. Since the cold outside air is heavier than the warm air around your body, it will not cool you much; so you might next loosen the cord at your neck. This creates a draft of heavy cold air falling down the front of you inside your outer garment, and it also permits the warm air to rise from your body. If you are still not cool enough, loosen the cords at your wrists and take off your mittens. Then you will have fuller circulation of the air.

For very cold weather, the jacket or parka should always have sleeves cut deeply enough at the shoulder line to permit you to pull your arms in next to the body, should they become too cold. That way you can pull them in, tuck the sleeves in your belt to keep out the air, and be warm again in no time.

Winter boots should be made of leather, felt, heavy canvas, or a combination of these. Rubber is a good conductor of chill and it will not allow moisture to escape from the feet. Further, boots should never be oiled or greased, for either substance will fill up the air chambers that are serving to keep in body heat.

AVOID GREASE ON SKIN

It is popularly believed that a coat of grease on the skin, especially the face, will help to insulate against the cold, but this is not true. It interferes with the normal escape of moisture and perspiration exuding constantly from the body, and this accumulated moisture can freeze under the grease.

A visit to the Museum's Eskimo exhibits in Joseph Nash Field Hall (Hall 10) may provide you with useful information.

Next Audubon Lecture January 3

"Animals Unaware," a lecture with motion pictures in color by Howard Cleaves, will be presented by the Illinois Audubon Society on Saturday afternoon, January 3, at 2:30 o'clock in the James Simpson Theatre of the Museum. The public is welcome to attend, free of charge.

STAFF NOTES

Mrs. Lenore Blanchard Warner of the Department of Botany appeared as a representative of the Museum on two recent television programs, one over WNBQ and the other on WGN-TV. She displayed American Indian dolls and answered questions about them. The dolls were selected from the collection that the Museum recently used in a special exhibit under a loan arrangement with Mrs. Warner. . . . **Dr. Sharat K. Roy**, Chief Curator of Geology, and **Dr. Robert H. Denison**, Curator of Fossil Fishes, attended the recent annual meetings in Boston of the Geological Society of America.

MEDALS FOR PHOTOS

The attention of all who are interested in nature photography, either as amateurs or professionals, is again called to the Eighth Chicago International Exhibition of Nature Photography to be held early in 1953. Entries in the contest must be submitted by January 17, and the exhibit of accepted pictures will be held at the Museum February 2 to March 1. Silver medals and ribbons will be awarded to winners in each classification of each division. Those interested may obtain official entry forms and a complete summary of the conditions of the contest by application to the Museum. The contest and exhibit are co-sponsored by the Chicago Nature Camera Club and the Museum.

NEW MEMBERS

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Miss Marion E. Merrill, Mrs. Frances B. Wagner

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GIFTS TO THE MUSEUM

Department of Anthropology:

From: Albert C. Langsner (deceased), presented by Mrs. Simon Rosen, Evanston, Ill.—ethnological specimens

Department of Geology:

From: Jarra Gem Corp., New York City —Jarra rutile gem; Arthur M. Ritchie, Olympia, Wash.—17 specimens of siderite concretions, Washington

KOREA CULTURE EXHIBIT

By H. B. HARTE
MANAGING EDITOR

WAR HAS HELD the spotlight of public interest on Korea for more than two and one-half years, and the focus was sharpened by the mission last month of President-elect Dwight D. Eisenhower. Nevertheless, although everybody may be talking about Korea, hardly anyone here knows much about the country, its people, and their culture. To provide some background of information the Museum has placed a special exhibit of Korean ethnological and archaeological material in Stanley Field Hall, where it will remain until January 31.

Old Korea, whose early history is fragmentary and largely dependent upon legend, apparently was first settled by Chinese emigrants about 1100 B.C. and for several centuries developed a culture paralleling that of China. This culture experienced its greatest fruition in a "golden age" about the 16th century. But, like that of many other civilizations, Korea's era of eminence in arts and industries came to an abrupt end in war. Japan conquered the country in 1592–98, and the best Korean artists and craftsmen were taken to Japan to work for new masters.

For several centuries Korea was almost cut off from the world and became known as the "hermit nation." Even partial recovery was exceedingly slow, and not until the 19th century was the country reopened to foreigners. Subsequently its history continued to be tragic, especially in the 20th century. Korea was a bone of contention in the war in which Japan defeated Russia in 1904–5, and in 1910 it was annexed formally by Japan. Regaining freedom at the end of World War II, it all too soon was plunged into the present conflict that is disturbing the entire world.

The material in this special exhibit is from the H. N. Higinbotham Korean collection that was presented to the Museum in 1899 but has not been on exhibition since 1943. The exhibit occupies two cases and ranges in scope from objects representing the peak of Korea's ancient culture to ethnic material of recent years before the shambles wrought by the present turmoil.

The collection, although small, is varied. There are several elaborate garments of courtiers and ladies of the time when Korea had its own royalty, some beautifully embroidered silk and woolen cushion covers that were once sent from the provinces as tributes to the king, a few ornamental objects carved of jade, and a number of small jade cylinders in which men of means carried their toothpicks. An oddity is a decorative folding wooden screen with paintings on its panels telling a story. This kind of screen was used to establish privacy at home and was always carried by wealthy travelers to maintain the dignity of aloofness.

In a collection of writing materials—ancient paper, writing-brushes, seals, and ink-making materials—is an early document, an examination paper for an official government appointment. This might be called a predecessor of the modern civil-service test paper, and shows ancient Chinese influence (the Museum has similar specimens from China). The applicant was required to write an essay indicating his qualifications for the job. Incidentally, the man seeking favor in the paper on display was rejected by the king, who had the final say after a board of examiners consisting of scholars had weighed the contents of the document.

Objects indicating beliefs in superstitions are displayed. There are divining boards that were used for telling personal fortunes and to predict major national events. Shown are charms upon which many persons depended for hope of good luck—small metal disks, like coins, with symbolic devices upon them that were worn usually in combination with tassels. There are also actual coins used in the monetary system, most of them inscribed with words meaning "worth 5."

ELABORATE HAIRDRESS

The exhibit indicates that styles of hairdress were elaborate. Pride was taken in piling up coils of hair on the heads of brides, bridesmaids, and women attending court. To augment their own hair, women used hair switches, examples of which are shown. Many of the switches were made from long hair cut from heads of youthful males, who, it appears, were not permitted to have haircuts until time for betrothal. Likewise the long hair of immature girls was cut—from underneath where it wouldn't show—and carefully saved for making switches. Apart from hairdressing for great occasions, switches were used to make up for the deficiencies of women with naturally thin hair or those whose tresses were depleted by the ravages of age, illness, or other misfortune. Yet with all this attention to appearance, women of the upper classes in old Korea seldom appeared in public.

Shoes of straw, underwear of cloth made from grass, children's clothes in bright colors, hat ornaments, hair ornaments, jade combs, mirrors, ear pendants, and girdle pendants are among articles of personal attire shown. Thimbles (made of cloth) and other objects used in sewing are also exhibited.

Musical instruments are represented by an ancient kind of zither and a drum, both used to provide rhythm for the court dancers. There are some good examples of ancient glazed pottery, fine bowls and other utensils of brass, cooking vessels of steatite, some ingenious equipment for fishing, a deck of playing cards, fancy pearl-inlaid hat boxes for which certain Korean craftsmen were once famous, and various objects of bamboo matting and basketry. Of the old Korean culture represented by most of the objects in this exhibit, little remains today.

FIFTY YEARS AGO AT THE MUSEUM

Compiled by MARGARET J. BAUER

From the *Annual Report of the Director* for the year 1903:

"Library.—The accessions in this important division of the Museum were specially noteworthy and numerous during the year just closed. An increase of 222 titles over those received in any previous year has to be recorded. This exceptional increase was due to the fact that exchange transactions were for the first time inaugurated with several learned institutions and societies both at home and abroad. The number and value of the publications thus obtained increases yearly, and every effort is made to extend the mailing list with this object in view."

CLARK'S GAZELLE

Group installed in 1903 by the late Carl E. Akeley, who collected the specimens on an expedition to Africa. Now in Akeley Memorial Hall (Hall 22).

Parícutin Volcano Studies Resumed

Studies begun by Dr. Sharat K. Roy, Chief Curator of Geology, on a previous expedition when Parícutin volcano in Mexico was in eruption will be continued now that the volcano is extinct or at least inactive. Dr. Roy was scheduled to leave Chicago in the last week of December and will remain at Parícutin for several weeks.

On the present expedition it will be possible, as it was not on the previous visit, for Dr. Roy to climb to the summit of Parícutin and make observations right at the volcano's crater. It will be possible also to collect some types of volcanic specimens not available when studies and collecting were restricted to the vicinity of the base. There is a possibility that Parícutin, like other volcanoes that have died down, might erupt again, and so the present quiescent period offers opportunity for further studies. Dr. Roy will have the co-operation of Mexican geologists and members of the United States Geological Survey.

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BULLETIN

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Chicago Natural History Museum

8th Chicago International Nature Photo Exhibit
February 2—March 1

Chicago Natural History Museum

FOUNDED BY MARSHALL FIELD, 1893

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Members are requested to inform the Museum promptly of changes of address.

MUSEUM VISITORS IN 1952 REACHED TOTAL OF 1,305,556

Attendance at Chicago Natural History Museum in 1952 totaled 1,305,556, a considerable gain over the preceding year when the number of visitors was 1,251,752. As in past years, those admitted free of charge overwhelmingly outnumbered those paying the nominal admission fee (25 cents plus 5 cents federal tax) charged to adults on certain days. Free admissions amounted to 1,170,786 persons—visitors on free days (Thursdays, Saturdays, and Sundays) and children, students, teachers, Members of the Museum, and uniformed officers and enlisted men of the armed forces. Those paying for admission numbered only 134,770, or less than 10½ per cent of the total. Balanced against the Museum's operating budget of more than $1,000,000 a year, the average cost to the institution for each visitor entering its doors is around 80 cents, as in other recent years.

The educational influence of the Museum, however, was far greater than this breakdown indicates, for its message was carried to hundreds of thousands besides those who visited the building. The James Nelson and Anna Louise Raymond Foundation with school lectures and the N. W. Harris Public School Extension with portable natural-history exhibits reached about half a million children repeatedly throughout the school terms. Other sections of the public were reached through publications, both popular and technical, issued by the Museum's own press. Furthermore, information resulting from the research activities of the scientific staff was disseminated by articles and pictures in magazines and newspapers and by special radio and television broadcasts.

ALL MUSEUM OFFICERS RE-ELECTED BY TRUSTEES

All officers of the preceding year were re-elected at the Annual Meeting of the Museum's Board of Trustees, held on January 19. The re-election of Stanley Field to the office of President marks his return to that position for his 45th consecutive year. Few individuals have had comparable records in this kind of public service, and few institutions have been favored by so long and consistent an administration under such a deeply interested and sympathetic leader.

Other officers re-elected are: Marshall Field, First Vice-President; Henry P. Isham, Second Vice-President; Samuel Insull, Jr., Third Vice-President; Solomon A. Smith, Treasurer; Colonel Clifford C. Gregg, Director and Secretary; and John R. Millar, Assistant Secretary. These officers, except Mr. Isham, who has completed his first year as Second Vice-President, have served the Museum for many years.

GIFTS TO THE MUSEUM FROM MANY SOURCES

Department of Anthropology:

From: C. F. Childs, Lake Forest, Ill.—2 Tibetan temple lamps, India

Department of Botany:

From: Dr. Fred A. Barkley, Yonkers, N.Y.—174 algae, Jamaica; Botanische Abteilung, Vienna, Austria—106 miscellaneous algae, Central Europe; Dr. Hugh C. Cutler, Lombard, Ill.—171 miscellaneous phanerogams, Bolivia and United States; Dr. Maxwell S. Doty, University of Hawaii, Honolulu—66 marine algae, North America; Dr. Julian A. Steyermark, Barrington, Ill.—5,722 phanerogams, central and southeastern United States; Floyd A. Swink, Cicero, Ill.—360 phanerogams, Illinois, Indiana, and Michigan; Dr. M. Cardenas, Cochabamba, Colombia—61 phanerogams, Bolivia; Dr. Henry Field, York Harbor, Me.—51 fungi, 52 phanerogams, Massachusetts and Florida; Donovan S. Correll, U. S. Department of Agriculture, Division of Plant Exploration and Introduction, Beltsville, Md.—391 bryophytes, Alaskan Highway

Department of Zoology:

From: Dr. Argentino A. Bonetto, Santa Fe, Argentina—collection of fresh-water clams, Santa Fe, Argentina; Luis de la Torre, Ann Arbor, Mich.—357 insects and allies, Guatemala; John Hedley, Edinburgh, Scotland—2 civet skins, claw of honey bear, North Borneo; Harry Hoogstraal, Cairo, Egypt—62 birdskins, Africa; Marshall Laird, Suva, Fiji—3 frogs, 27 lizards, New Hebrides and Fiji; Dr. Reuben A. Moser, Omaha, Neb.—2 birdskins, Nebraska; Museo de Historia Natural de La Salle, Bogotá, Colombia—46 mammals, Colombia; Verne C. Record, Chicago—large hornet nest, Cordova; Bernard Benesh, Burrville, Tenn.—141 pinned insects, Tennessee; Chicago Zoological Society, Brookfield—2 mammals; V. Critchton, Wellington, N.Z.—2 woodboring beetles, New Zealand; Mr. and Mrs. J. W. Donovan, West Palm Beach, Fla.—collection of Canadian nonmarine mollusks; Dr. Carl J. Drake, Ames, Iowa—36 truebugs, various localities; Lloyd G. Gage, Yuma, Ariz.—collection of sea urchins, Mexico; Ray Grow, Gary, Ind.—head and wing of bird (*Gavia immer*), Indiana; Dr. A. J. Nicholson, Billings, Mont.—11 porpoise skulls, 55 bats, Japan; Harley Schwass, Chicago—gray fox, Illinois; Texas Game and Fish Commission, Rockport—collection of marine invertebrates, Gulf of Mexico

Library:

From: T. N. Campbell, Department of Anthropology, University of Texas, Austin; L. Kibbe, Carthage College, Carthage, Ill.; Dr. Karl P. Schmidt, Homewood, Ill.

THIS MONTH'S COVER

"The Sky Is So High" is the title given by Tan Seng Huat, photographer, to the picture reproduced on our cover. Mr. Tan, who lives in Penang, Malaya, submitted it for the Eighth Chicago International Exhibition of Nature Photography to be held by the Chicago Nature Camera Club and the Museum in Stanley Field Hall from February 2 through March 1. The animal shown hanging from the highest branches of a tropical tree is a baby siamang (Symphalangus syndactylus Raffles), a close relative of the gibbons. A full account of the exhibit of photographs will be found on page 3.

Museum Board of Trustees Elects Harold Trapido a Contributor

Dr. Harold Trapido, of the Institute of Tropical Medicine, Gorgas Memorial Laboratory, Panama City, Canal Zone, was elected a Contributor by the Museum's Board of Trustees at its meeting on January 19. Contributors are a special membership class designating those who give money or materials valued at $1,000 to $100,000. Dr. Trapido is the donor of important collections of amphibians and reptiles to the Department of Zoology.

NATURE'S STORY TOLD IN ANNUAL PHOTOGRAPHIC EXHIBIT

CHICAGO Natural History Museum will become, in part, a picture gallery in the period from February 2 through March 1, when the Eighth Chicago International Exhibition of Nature Photography is held in Stanley Field Hall.

'THE WALKING HILLS'

This photograph of a strikingly beautiful dunes scene was entered for the Nature Photography Exhibit by Karl Obeet, of Santa Barbara, California. Because this Bulletin went to press before the judges made their decisions, publication of any of the photographs in this issue does not necessarily signify acceptance for the exhibit.

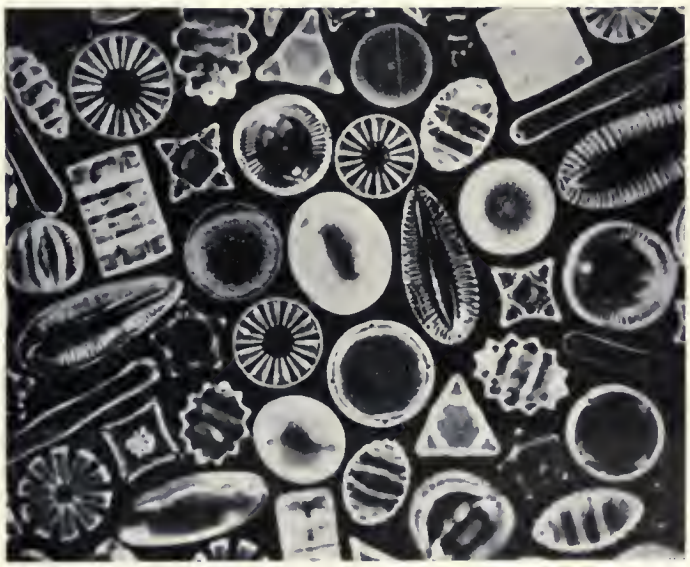
The recording of the phenomena of nature by camera is closely related in purpose to the Museum's own functions of investigating nature in all its aspects, preserving specimens that tell its story, and, by exhibits and other means, spreading information about the earth, its origin and composition, and the plants, animals, and peoples that inhabit it. Thus the alliance that began in 1946 between the Chicago Nature Camera Club and the Museum has been a natural one, and it has resulted in a series of annual photographic exhibits.

Each year there have been more pictures in the Chicago International Exhibition, selected each time from a greater number of entries submitted by an ever-growing number of contestants living in farther parts of the world. In its special field of nature photography this exhibit has come to be recognized as the largest of its kind held anywhere in this country or abroad. In fact, it ranks among the few largest shows even when grouped with those whose subjects are not limited to nature or any other restricted field.

Both amateur and professional photographers submit their work, and the entries for this year's event have exceeded 3,000. From among these the panel of judges has selected more than 200 prints and approximately 800 color-transparencies for display. The judges were R. B. Horner, photographer and Associate of the Photographic Society of America; Dr. J. W. Hudson, acting chairman of the Department of Biology, Loyola University, and president of the Chicago Ornithological Society; W. C. Radebaugh, photographer; Douglas E. Tibbitts, Staff Illustrator at the Museum; and Miss Miriam Wood, Chief of the Museum's Raymond Foundation.

The exhibit is in two divisions. Prints constitute one division and are displayed on screens in Museum exhibition cases in Stanley Field Hall. The miniature transparencies, which make up the second division, are installed nearby in special cases with internal fluorescent lighting that brings out the colors and details. There are so many transparencies that groups of about 200 are shown each week of the exhibition period. In addition, at 3 o'clock on two Sunday afternoons, February 15 and 22, there will be special showings of the transparencies in the James Simpson Theatre, where they will be projected in greatly magnified form. Background music will match the moods of the pictures. The public is invited, and admission is free.

Each of the two divisions includes three classifications of pictures: animal life, plant life, and general (the last includes scenery, geological formations, clouds, etc.). Awards of silver medals and honorable-mention ribbons have been made to the prints and slides adjudged the best. Permanent recognition is accorded to the medal winners on a bronze plaque at the Museum given by Mrs. Myrtle Walgreen, a camera enthusiast and member of the Chicago Nature Camera Club. Two special medals are awarded by the Nature Division of the Photographic Society of America, which has given a Class-A rating to the annual Chicago exhibit.



'DIATOMS IN DARK FIELD'

A photomicrograph showing tiny unicellular algae invisible to the naked eye. In the reproduction above they are magnified about 1,500-times life-size; the photograph in the size submitted for exhibition magnifies them 3,000 times. The delicate sculpturing of the siliceous skeletons of these microscopic plants is revealed in this entry for the Nature Photography Exhibit, which was submitted by William M. Angus, Jr., 6916 South Oglesby Avenue, Chicago.

Audubon Lecture February 28

The Illinois Audubon Society will present "Oddities in Nature," a lecture with color-film by Walter H. Shackleton on Saturday afternoon, February 28, at 2:30 o'clock in the James Simpson Theatre of the Museum. The film records events in the lives of small creatures inhabiting Kentucky lakes, swamps, upland marshes, and deep woods. The public is invited, and admission is free. Members of the Illinois Audubon Society and of the Museum may have seats in the reserved section of the theatre upon presentation of their membership cards to the ushers, but reserved seats must be claimed not later than 2:25 P.M.

The Riddle of Man

Every human life involves an unfathomable mystery, for man is the riddle of the universe, and the riddle of man is his endowment with personal capacities. The stars are not so strange as the mind that studies them, analyzes their light, and measures their distance.—*Harry E. Fosdick*

RESEARCH AND EXPLORATORY FISHING IN GULF OF MEXICO

(The writer of the following account of fisheries research and Robert F. Inger, Assistant Curator of Fishes, recently returned with collections for the Museum made possible by their participation, at the invitation of the U.S. Fish and Wildlife Service, in a 1,500-mile exploration cruise aboard a government motor-vessel.)

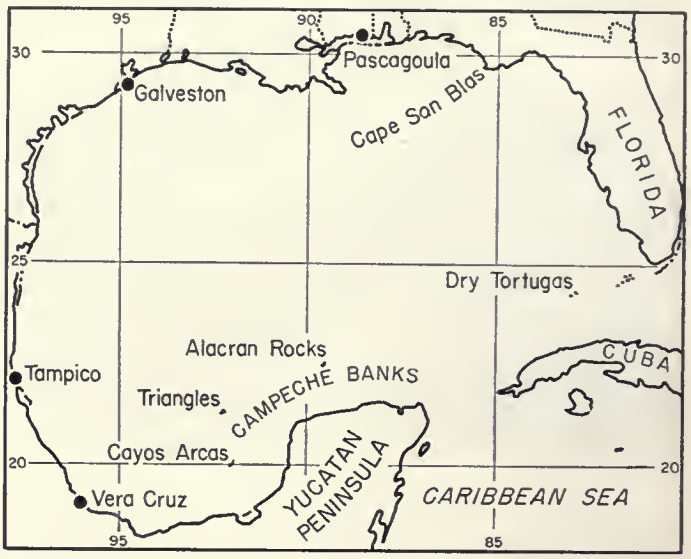
By LOREN P. WOODS
CURATOR OF FISHES

THE GULF OF MEXICO, in spite of its ready accessibility and its long shoreline in the southern United States, has received no over-all or detailed study from oceanographers and biologists, particularly ichthyologists, until quite recently. The reasons for this are not hard to find. The oceanographers studying the Gulf Stream concentrated on the Caribbean Sea and the Florida Straits, while the ichthyologists were content to sample the interesting reef fishes of the Florida Keys and the abundant fauna of Mississippi Sound, just east of the Mississippi River delta, and of Laguna Madre along the shore of southwestern Texas. To carry on work away from the shore required large boats as well as considerable financial support.

Within the past ten years, however, a great need for information, both physical and biological, had been discovered by several different though curiously interrelated industries. The oil industry had extended its fields into the tidelands and desired information on the substratum and general geomorphology of the Gulf Basin. This industry also supported research on the chemistry and general physical oceanography of the northern Gulf and was interested in such research as the present and past distribution of the foraminifera over the entire Gulf.

The paper mills and plastic mills located near the mouths of several navigable rivers as well as the oil refineries were vitally interested in the effects of their effluent pollution on the animals living in the estuaries and sounds. The oysters along the entire Gulf Coast have diminished at an alarming rate during the past few years and lawsuits between the oyster, oil, and paper industries involving enormous sums are perpetually in the courts.

The menhaden processing-plants for fish oil and fish meal have been enlarged since 1946, and new plants have been built all along the Gulf coast. Menhaden are fishes famous for maintaining fabulous schools for several years and then suddenly disappearing. The life-histories of these fishes, which belong to the herring family, are almost unknown. The spawning and nursery areas, the parasite that is supposed to cause sterilization in the males, and even the food are unknown. There is still no adequate knowledge in spite of the fact that the menhaden fishery has for the past few years ranked first in volume of the United States East Coast fisheries with a catch in 1948 of more than a billion pounds. It was only in 1948 that the five species of North American menhaden were distinguished.



MAP OF GULF AREAS REFERRED TO BY CURATOR WOODS

Most of the shrimping and fishing in the Gulf was previously carried on in the shallow waters near shore. This zone has always in the past been subject to considerable fluctuation in production resulting from natural causes as well as the direct influence of man. The outstanding natural catastrophes affecting fisheries have been the fish kills along the Texas lagoons and coasts. These are caused by sudden cold northern winds that chill the shallow water, even to the extent of forming ice, thus killing the fish to considerable depth. The coastal fisheries require from two to three years to recover from severe "norther" kills.

Another natural calamity is the "red tide" that affects not only the beach and tourist business along the Florida west coast but to some extent the fisheries by killing surface and shallow-water organisms including young shrimp and the young of some commercially important species of fishes. A "red tide" results from periodic increase of microscopic one-celled organisms that contain reddish-brown pigment. The great numbers of such animals are sufficient to give a reddish cast to the sea. The long-range effects on fisheries by the "red tides" is not known. Unknown also is the basic underlying cause of the upset in balance that makes a "red tide" possible.

Since 1946, the white-shrimp fishery, which had been carried on in the northern Gulf, has declined. Fortunately, however, pink shrimp were discovered in fairly deep waters in the Florida Keys and brown shrimp off the Texas coast. This gave a great impetus to the construction of shrimp boats and gear that were capable of working in deep water. The availability of larger boats and experienced men then, in turn, made possible the exploitation of the extensive and extremely productive shrimp beds of Campeche Banks in the southern Gulf of Mexico. These banks, lying to the north and west of the Yucatan peninsula, had previously been frequented by United States fishermen only for red snappers.

All of the large coastal industries mentioned previously plus the rapidly expanding fisheries (including fish processing-plants for menhaden and tuna), creating and facing many oceanographic and biological problems, have pointed out again and again the pressing need for exploration and information on the Gulf. The oil and oyster industries had long supported research relating to their immediate and specific problems; the shrimp fishermen had done considerable exploration for new grounds and had experimented with new gear at their own expense but had reached their limits.

Sporadic oceanographic research was carried on from time to time by various private and government institutions off the mouth of the Mississippi. Shore-based inshore biological research limited in time, scope, and financial support has long been the concern of the states bordering the Gulf and of the United States Fish and Wildlife

'ANCHORS AWEIGH!'

Motor Vessel "Oregon" of U. S. Fish and Wildlife Service leaves harbor at Pascagoula, Mississippi, for fishing grounds. Large roofed tank astern carries a supply of bait. On cruise, two Museum ichthyologists were aboard to collect specimens.

Service. It is only recently that the requirements of broader basic information over large areas have become crucial to the understanding, predictions, control, and perpetuation of the many industries and food sources in the Gulf.

This need is being met by some conference and co-ordination among the research workers and institutions along the Gulf coast and especially by the work of two large research vessels brought into the Gulf in 1951 by the Fish and Wildlife Service. These are former tuna clippers, converted for various types of research, the sister ships *Alaska*, based at Galveston, Texas, and *Oregon*, based at Pascagoula, Mississippi. The *Alaska* is equipped and staffed for doing all types of oceanographic research: the chemistry and physics of the seas and related biological problems concerning plankton and larval fish. The *Oregon*, on the other hand, devotes its efforts to discovering and exploring new shrimp beds and extending the area and determining the productivity of known beds. Along with shrimp exploration goes the search for additional kinds of fishes, such as tuna, hake, flounder, and tilefish, that may be exploited commercially, and the development and testing of new and better types of gear both for shrimping and fishing.

SORTING CONTENTS OF A TRAWL CATCH

Members of the crew begin task of segregating many kinds of fishes and shells dumped on deck of "Oregon" from a single haul of one of the big dragnets. From such catches Museum curators garnered many specimens.

SOURCE OF TUNA

The discovery by tuna fishermen that the Gulf coast was actually nearer to the source of tuna in the tropical East Pacific than was California resulted in the construction of a tuna cannery on the Gulf coast and the building of two vessels to serve it. This enterprise requires live bait-fishes and these have been discovered on Campeche Banks in unlimited quantities at certain seasons, although their distribution and occurrence throughout the year are not yet known.

Bait is notoriously scarce and generally close inshore in shallow water along the Pacific coast of Central America, and it is carefully conserved by the countries there. The tuna bait-fishes of the Gulf have been determined, and their abundance and occurrence on Campeche Banks are being studied by the *Oregon* staff. Surveys have been made in the Gulf and are to be made in the Caribbean to determine the amount and kinds of tuna available there. Through the courtesy of the Fish and Wildlife Service, the writer and Robert F. Inger, Assistant Curator of Fishes, have been permitted to participate on behalf of the Museum in cruises of the *Oregon*.

Incidental to this exploration, which has extended into every part of the Gulf, is the landing of large quantities and a great variety of fishes from every kind of habitat from 7 to 500 fathoms and from within sight of shore to the center of the Gulf. There have been also accidental side trips up a Mexican River, to escape a hurricane, and investigations of the faunas of unexplored coral reefs lying 60 to 90 miles offshore on the Campeche Bank. These explorations led to the finding of bones of the nearly extinct West Indian seal. Time would never have been spent on these reefs had the *Oregon* not been forced to take shelter from storms in the lee of the Cayos. Also, while cruising in both north and south portions of the Gulf during the spring and fall bird-migrations, many observations and collections have been made bearing on this little-known subject.

Most important to the Fish Division of Chicago Natural History Museum and to ichthyologists in several other museums who are working on various aspects of the fish life of the Gulf has been the accumulation of very large collections and a great deal of data regarding the ecological and geographical distribution of the fishes of the Gulf. Our studies of offshore fishes of the northern Gulf have greatly increased our knowledge of the environmental factors that influence the distribution of a given species in depth. The collections have given us a pretty clear idea of the kinds of fishes that live together and make up the fish community at various depths and over particular kinds of bottom. The members of the *Oregon's* staff have concerned themselves with obtaining and tabulating quantitative information on shrimp and fish.

The fishes of Campeche Banks were very poorly known until the *Oregon* began its periodic surveys of the shrimp beds there. From preliminary study it now appears that in the offshore regions, considering the bottom fishes from 8 to 50 fathoms, the fauna is essentially the same as at these depths off the coasts of Mississippi, Louisiana, and Texas, with very few additional tropical species present. It seems very likely that at these depths the fauna is continuous from the northern portion of Campeche Banks westward along the adjoining coasts of Mexico and Texas as far east as Cape San Blas, Florida.

This continuous distribution does not appear to be the case with fishes living in shallow water. There are some tropical elements entering into the southern Gulf area that are not found along the northern Gulf. It is believed that somewhere along the Mexican coast, probably between Tampico and Veracruz, shore fauna characteristic of the northern Gulf gradually becomes dominated by tropical species. In lagoons and estuaries of the Yucatan peninsula there are several kinds of fishes, such as silversides, top minnows, and a halfbeak, whose nearest relatives live in similar habitats near the southern tip of peninsular Florida. On the shallow coral reefs of the Cayos lying near the western edge of Campeche Banks the fish fauna has been found to be practically identical with that of the coral reefs of the Dry Tortugas, Florida.

It is believed that when the data obtained on our two collecting trips to Campeche Banks (made in August, 1951, and December, 1952) are combined, we will have sufficient information to understand the geographical distribution of the fishes of these banks and the extent of the relationship of this fauna to that of the rest of the Gulf of Mexico and, to a lesser degree, to the adjacent banks and reefs lying in the Caribbean Sea.

New Definition of News . . .

FISH EATS BIRD!

By AUSTIN L. RAND
CURATOR OF BIRDS

IT HAS BECOME commonplace to hear about birds eating fish. The government gets out reports on the relation of fish-eating birds to fish hatcheries. The cries of commercial fisheries have caused inquiries to be instituted into the food of cormorants that were supposed to be eating the fish before they grew up enough for us to eat. The scarcity of salmon on some of our northeastern streams has caused the allocation of biologists to study the effect of kingfishers and mergansers on salmon fry and fingerlings.

But fishes get back some of their own by eating birds. The facts fit the old "man-

bites-dog" definition of news but are probably not widely known.

To one who has fished for large-mouth black bass amongst the cypress trees and bonnets of water hyacinth and has seen these bass strike savagely at surface lures as soon as they hit the surface, it comes as no surprise to find that bass strike at and catch such birds as Maryland yellow-throats that flutter across the water close to the surface.

Young ducks, too, are good game to the large-mouth, and probably many a young duck finds its way into the maw of a bass. On a pond where bass had taken many young ducks, a fisherman made a floating model of a mother duck, powered it with a motor and propeller, and attached to it by lines of various lengths several floating models of downy ducklings. In each duckling was concealed a hook. The whole flotilla was set afloat and drifted across the pond. Mother steamed ahead, with young following. Soon the bass, used to a duck diet, began to grab the ducklings. When the model was retrieved several prize bass had been taken.

In northern waters, where northern pike or jack-fish, as they're called in the north, abound in duck-nesting waters, pike are accused of eating so many ducklings as to affect the survival of the broods. Many a marshland traveler has reported young ducks and young grebes diving, to be seen no more, and has blamed the pike. Sometimes perhaps the young bird has simply come up unobserved, but enough pike's stomachs have proved to have young ducks in them to demonstrate that pike do eat ducklings. Strangely enough, pike in some areas eat many ducklings but in others they do not eat them. The muskellunge, as might be expected from its large size, is also supposed to feed on ducklings.

But it's not alone young birds, or small birds, that are eaten by fishes. A 24-inch bass is recorded as having been caught while it still had the legs of a full-grown coot projecting from its mouth. From beak to tip of its outstretched legs the coot measured 17 inches and it weighed one pound and a quarter. Angler fish, weighing between 40 and 50 pounds, have been found to have eaten birds. One had the band from a Manx shearwater in its stomach, and another had an adult American merganser.

Birds of tropical and subtropical seas have been examined that, from scars on their legs, evidently had been attacked by a fish and seized by the feet but were able to escape. A white-winged black tern ofi Corsica has been seen to disappear under water, presumably dragged under by a fish.

MUSEUM EXPEDITIONS FOR 1953 LISTED

The 1953 program of expeditions and field work for members of the Museum's scientific staff (and some associates not on the regular staff) has been announced by Colonel Clifford C. Gregg, Director. Collecting assignments will be carried on both in foreign lands and the United States by sixteen individuals or groups of workers.

The largest undertaking will be the 19th season of operations, from about May to October, of the Museum's Southwest Archaeological Expedition led by Dr. Paul S. Martin, Chief Curator of Anthropology. Dr. Martin will be accompanied by other members of the staff, students from universities, and local labor recruited to assist on the "dig" of prehistoric Indian culture sites in the mountainous region near Reserve, New Mexico. This project involves collecting artifacts of peoples who populated the area as far back as 3,500 years ago and reconstruction of their history.

'LOST WORLD' EXPLORATION

The little-known "lost-world" area of Venezuela will be botanically explored by Dr. Julian A. Steyermark, Curator of the Phanerogamic Herbarium, scheduled to leave early in the year. He will be accompanied by Charles Griffin, a Missouri naturalist.

Dr. Austin L. Rand, Curator of Birds, will go to the Philippines in the autumn on an ornithological expedition. Celestino Kalinowski of the Museum taxidermy staff, will collect mammals, birds, and reptiles in Peru, beginning in April. Cruising aboard a 37-foot auxiliary schooner, an expedition will collect fishes along the coasts of Central America and the West Indies. This expedition will be conducted by Donald Erdman, ichthyologist retired from the U. S. National Museum, Washington, D.C. Mr. Erdman, now a resident of Costa Rica, is owner of the cruiser.

There are four expeditions to Mexico. Clifford H. Pope, Curator of Amphibians and Reptiles, will leave early in the year to collect and study salamanders in mountains of the Mexican state of Sonora and also in California. Dr. Sharat K. Roy, Chief Curator of Geology, left in January for a further study of Mexico's famous Parícutin volcano, which is now dormant. Emmet R. Blake, Associate Curator of Birds, will go to Mexico in the spring for an ornithological survey. Late in the year Loren P. Woods, Curator of Fishes, will collect marine life of the west coast of Mexico, centering on the Acapulco area.

FOSSIL-PLANT SURVEY

Dr. Theodor Just, Chief Curator of Botany, will explore parts of the eastern United States from Virginia northward in search of fossil plants of Triassic age (about 185 million years ago). Emil Sella, Curator of Exhibits in the Department of Botany, will spend June and July in Tennessee and North Carolina collecting material for the Museum's Hall of Plant Life.

Dr. Robert H. Denison, Curator of Fossil Fishes, will collect in important fields of Pennsylvania. Dr. Rainer Zangerl, Curator of Fossil Reptiles, will investigate ecological conditions that produced rich fossil deposits in certain parts of Indiana. Eugene S. Richardson, Jr., Curator of Fossil Invertebrates, and George Langford, Curator of Fossil Plants, will collect in Illinois, Indiana, and adjoining territory.

Henry S. Dybas, Associate Curator of Insects, will make three seasonal trips (spring, summer, and autumn) to collect insects and observe prevalence conditions in various areas of the southern Mississippi Valley and the Middle West. Dr. Fritz Haas, Curator of Lower Invertebrates, will collect on the coasts of Oregon and Washington.

In addition to expeditions, Dr. Karl P. Schmidt, Chief Curator of Zoology, will represent the Museum at the International Zoological Congress in Copenhagen, Denmark, and Curator Rand will represent the Museum at the Eighth Pacific Science Congress in Manila. Robert K. Wyant, Curator of Economic Geology, and Chief Curator Roy will go to Washington, D.C., to undertake special research on meteorites.

MUSEUM PALEONTOLOGIST TO APPEAR ON TV

"This Wonderful World," a new weekly television show (WENR-TV, ABC, Channel 7, Mondays, 7:30 P.M.) that will feature scientific and cultural subjects, presents the first of several Chicago Natural History Museum programs on March 2. On that date Eugene S. Richardson, Jr., Curator of Fossil Invertebrates, will demonstrate how scientists investigate life on the earth as it was hundreds of millions of years ago. In addition to a discussion of this subject with "Woody" Klose, producer of the program, motion pictures will be shown of Curator Richardson collecting Coal Age fossils 250-million years old in the Braidwood area of Will County, Illinois. The curator will also display fossil specimens and other material from Museum exhibits and research collections to illustrate his subject. Other members of the Museum's staff will appear in this educational series later.

This is one of a number of recently instituted activities by which Museum communication with the public through the medium of TV is being increased. Seven young women of the Raymond Foundation lecture staff have been appearing in interview programs about Museum subjects on all four Chicago television stations, and other programs of this type are to be presented throughout February. Definite dates and hours, however, cannot be scheduled sufficiently in advance for announcement here. At frequent intervals every day on every Chicago station, Museum "spot" announcements are appearing. The Museum has been co-operating also in educational programs of universities, colleges, and other institutions by furnishing material and information in fields for which it is the primary source.

Lectures, Movies Start March 7 . . .

ADULTS, CHILDREN INVITED TO MUSEUM THEATRE

The Museum's annual Saturday afternoon Spring Course of illustrated lectures for adults on science, travel, and exploration and the series of Saturday morning motion-picture programs for children will begin on March 7. Both programs will continue on Saturdays throughout March and April in the James Simpson Theatre of the Museum and are free.

The lectures for adults are provided by the Edward E. Ayer Lecture Foundation Fund. The first one will be "Siam," by Herbert Knapp, at 2:30 P.M. on March 7. The children's programs, presented under the auspices of the James Nelson and Anna Louise Raymond Foundation, will start on March 7 at 10:30 A.M. with "Story of the Desert" and an animated cartoon.

Complete schedules of both the adult and children's programs will appear in the March issue of the BULLETIN. For the afternoon lectures, each Member of the Museum is entitled to two seats in the reserved section upon advance application by mail or telephone (WAbash 2-9410). Seats will be held in the Member's name before the lecture until 2:25 P.M.

Dallwig on Tour; Will Resume Museum Lectures in March

Paul G. Dallwig, the Layman Lecturer, is suspending his appearances at the Museum during February because of an out-of-town lecture tour. His next lecture at the Museum will be on Sunday, March 1, at 2 P. M., when he will present "A Museum Zoo Is Exciting Too." The same lecture will be repeated at 2 P. M. on each of the other Sundays in the month—March 8, 15, 22, and 29. Members of the Museum may attend the lectures without advance reservations by presentation of their membership cards. For others, reservations for the March lectures and also for Sundays in April, when the subject will be "Living Races and Their Way of Life," may be made during February by mail or telephone (WAbash 2-9410).

Noted Mycologist Here

Dr. Rolf Singer, specialist in Basidiomycetes, has arrived at the Museum for a three-month stay to study South American fungi in the Cryptogamic Herbarium. He was awarded a John Simon Guggenheim Memorial Fellowship in 1942–43, which was renewed for 1952–53, for the study of subtropical and tropical fungi. He spent the first few months of his fellowship-year at the Farlow Herbarium, Harvard University.

Dr. Singer has taken part in many mycological expeditions to the Caucasus, Central Asia, and the American subtropics and tropics. He was professor extraordinary at the National University of Tucumán, Argentina (1948–52), from which he took a leave of absence in September, 1952. He is the author of a new classification of the polypores, agarics, and boletes (*The Agaricales in Modern Taxonomy*, Lilloa, 1949) and of about 100 other publications, books, monographs, and short articles. Recently he published the first comprehensive account of the Agaricales of Argentina and now is preparing a treatment of South American Agaricales.

Technical Publications

The following technical publications were issued recently by Chicago Natural History Museum:

Fieldiana: Anthropology, Vol. 40. *Mogollon Cultural Continuity and Change—The Stratigraphic Analysis of Tularosa and Cordova Caves.* By Paul S. Martin, John B. Rinaldo, Elaine Bluhm, Hugh C. Cutler, Roger Grange, Jr. November 17, 1952. 528 pages. $8

Fieldiana: Botany, Vol. 26, No. 1. *Orchids of Guatemala.* By Oakes Ames and Donovan Stewart Correll. August 29, 1952. 408 pages. $4, paper; $5, buckram

Fieldiana: Zoology, Vol. 33, No. 2. *Philippine Zoological Expedition 1946–1947, Mammals.* By Colin Campbell Sanborn. November 28, 1952. 80 pages. $1.50

Fieldiana: Zoology, Vol. 34, No. 5. *A Collection of Birds from Mount Cameroon.* By Rudyerd Boulton and Austin L. Rand. October 9, 1952. 30 pages. $ .40

Immigrant from South . . .

CHICAGO AREA GRAY FOX

By COLIN CAMPBELL SANBORN
CURATOR OF MAMMALS

The gray fox and opossum are two southern mammals that were almost unknown in the Chicago area twenty-five years ago. Each has gradually moved northward since then until today the opossum is abundant and the gray fox is reported with increasing frequency.

The most recent instance of a gray fox is one found in a poacher's trap by Ranger Harley Schwass and received by the Museum through the interest of Dr. David Thompson, Senior Naturalist of the Cook County Forest Preserves. The Museum also has one from near La Grange taken in 1948, two from Highland Park trapped in 1946, and one from near Peru, Illinois, shot in 1940. Undoubtedly there have been others taken of which no record has been kept.

The black tail-tip in the gray fox distinguishes it from the red fox, in which the tail-tip is white. The gray fox lives in wooded country and often climbs sloping trees or ones with low branches. It has cosmopolitan tastes and eats almost anything, but it has a strong preference for meat. Many injurious rodents are taken by it, and some birds, eggs, fruit, berries, and mushrooms. It will take chickens if the owner keeps them poorly housed or unprotected, for which the fox cannot be blamed.

Gray foxes, of which there are numerous forms, range over the eastern United States to Florida and west to the Great Lakes region, and also California, the Southwest, and south to northern South America. It is to be hoped that the gray fox will establish itself in the wooded parts of the Chicago area from which so many of our native mammals have been extirpated.

Curator in Seminar

Dr. Rainer Zangerl, Curator of Fossil Reptiles, addressed a biological seminar at the University of Notre Dame on "The Practical Side in the Discussion of the Morphological Method."

COELACANTH, 'FRONT PAGE FISH,' IS IN MUSEUM

The newspapers recently have had numerous accounts, some rating even prominent space on front pages, about a little-known species of fish that the South African ichthyologist, Professor J. L. B. Smith, of Rhodes University, is quoted as identifying as a Coelacanth.

NEWS SPOTLIGHT FOCUSES ON MUSEUM EXHIBIT

Model on exhibition in Hall of Fishes (Hall O) represents Latimeria chalumnae, an example of a 350-million-year-old type of fishes still living in the seas. The fish is a member of the family Coelacanthidae. The Coelacanths were believed to have been extinct since Cretaceous time (75 million years ago) until the recent acquisition of a specimen by Professor J. L. B. Smith, South African ichthyologist, with a consequent big "splash" on front pages the world over. The Museum model of Latimeria is based on photographs and description published by Professor Smith, who studied a specimen caught in 1938. The capture in December, 1952, of another Coelacanth very similar to Latimeria, brought the above Museum exhibit, installed in 1945, back to widespread attention in the press early this year.

The Coelacanth (hollow-spined) fishes, belonging to the larger group of Crossopterygian fishes, were believed to have been extinct since Cretaceous time (75 million years ago). On December 22, 1938, a living specimen of a Coelacanth, later named *Latimeria chalumnae*, was captured in a trawl in 234 feet of water three miles off the mouth of the Chalumna River, near East London, South Africa.

The recent stir in the daily press began with the acquisition by Professor Smith of a second specimen, caught about December 21, 1952, apparently of a species different from the first. It was netted in only 60 feet of water, 200 yards offshore from Anjuan Island, one of the Comoros situated off the northwest coast of Madagascar. This place of capture is more than 1,700 miles north of the locality of the first.

The only parts preserved of the first specimen were the skin and part of the skull. Most of the soft parts of the second specimen are well preserved, but apparently the head is badly damaged.

The Crossopterygian (fringe-finned) group, in addition to the Coelacanth branch, contains another subgroup, the Rhipidistians (fan-finned), from which the amphibians descended. Anatomical studies of this important early stock of fishes have all been based on fossilized skeletal remains. To have a near-relative available for study of the soft anatomy is great good fortune. Information based on the soft anatomy should shed considerable light on the structural organization of the group from which the first land-vertebrates arose.

A model of *Latimeria chalumnae*, constructed by Leon L. Pray from photographs, may be seen in the Hall of Fishes (Hall O) at this Museum.

LOREN P. WOODS
Curator of Fishes

Curator Pope to Resume Studies in Field

Clifford H. Pope, Curator of Amphibians and Reptiles, plans to make during late winter and early spring a study of the habitats of the salamanders of southern California. This will add a new field of investigations to those he has already worked in the southern Appalachians and in central Mexico. In the summer of 1952, he carried on field studies of salamanders in the region of Jalapa, Veracruz, and collections of reptiles and other amphibians were made there. He will also visit the Mexican state of Sonora to secure series of desert reptiles for the study collection of the Museum.

Color photographs will be made to record the various salamander species and their haunts. Such pictures are especially valuable in working with animals that lose much of their natural colors in preservative, as do salamanders. In these amphibians, color differences are of great value in classification.

FIFTY YEARS AGO AT THE MUSEUM

Compiled by MARGARET J. BAUER

From the *Annual Report of the Director* (the late Dr. Frederick J. V. Skiff) for the year 1903:

"Maintenance.—It was stated in my last report that the building was perfectly safe, and I have no hesitation in reiterating that statement, and no anxiety need be felt as to any accidents occurring either to visitors or to those employed in the building, but the periodical attempts to improve the outside appearance of the walls have ceased as it has been conclusively proven that such efforts were ineffectual. In fact, the introduction of new plaster in patching seemed to loosen a larger area than was repaired. The roof of the Museum building is, perhaps, today in better order than it ever has been, and it is doubtful if the interior has been so well protected from leakages since the construction of the building; but this condition is due to constant vigilance."

Daily Guide-Lectures

Free guide-lecture tours are offered at 2 P.M. daily except Sundays under the title "Highlights of the Exhibits." These tours are designed to give a general idea of the entire Museum and its scope of activities.

Special tours on subjects within the range of the Museum exhibits are available Mondays through Fridays for parties of ten or more persons. Requests for such service must be made at least one week in advance.

Although there are no tours on Sundays, the Museum is open from 9 A.M. to 5 P.M. (4 P.M. on weekdays).

NEW MEMBERS

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Life Member
Louis Ware

Associate Members
Isidore Brown, Howard T. Greene

Annual Members
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Siamese Temple Guardian Figure
(from film with opening lecture in Spring Series, March 7—April 25)

Chicago Natural History Museum

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Members are requested to inform the Museum promptly of changes of address.

A CHAPTER FROM HISTORY OF MUSEUM'S EARLY DAYS

THE EXHIBITION of animals, especially of mammals and birds, in family groups or natural aggregations in museums of natural history was a revolutionary innovation in its day. The techniques involved had a multitude of origins. It was the late Carl E. Akeley who initiated the program of such habitat groups in this Museum when he joined our staff in 1894.

Akeley for some years had a private studio in Milwaukee and, by the success of his invention of the method of mounting animals by a process of sculpture (instead of by stuffing them), had gained the reputation of being the leading taxidermist in America. On the invitation of Sir William Flower, who was Director of the British Museum (Natural History), in London, Akeley was about to go to England to undertake an exhibition program in the then still new London building. But he was irrevocably diverted by the even greater challenge to his abilities presented by the empty halls of the still newer Field Columbian Museum, as the Chicago institution was known at the time. In 1894 this Museum's nucleus of collections, assembled by the great Chicago World's Fair the year before, seemed lost in the spacious halls of the fair's Fine Arts Building in Jackson Park into which the material had been moved.

Akeley's first habitat representations of African antelopes were consciously statuesque groups, with a minimum of vegetation and groundwork. The next major step was the representation of the backgrounds by a landscape painting in combination with the life-size foreground accessories.

The enormous success of the "battle panorama" or "cyclorama" in the post-Civil war era in American cities provided an impressive example of exactly this combination of modeled foreground and painted background. In the 1880's Chicago had at least two such panoramas of the largest size, "The Battle of Gettysburg" and "The Battle of Missionary Ridge." The domed structures for these spectacular creations quite dominated Wabash Avenue. The vast circular paintings of the cycloramas were 60 feet high and hung on the walls of circular buildings 130 feet in diameter.

Akeley found one of the artists employed on these extraordinary landscapes to be exactly the man who could adapt this exhibition technique to the Museum—Charles Abel Corwin, whose name came to stand next only to that of Akeley in the annals of American museums. Corwin combined realistic detail with a flair for large-scale painting. His work was in convincing perspective and always adjusted or adjustable to the planned foreground and the dominating "real" animal figures. A census of the halls of Chicago Natural History Museum shows that Corwin, in his two periods of employment here, finished no less than sixty-three backgrounds before his death in 1938. In addition, he helped to train an able successor, the late Arthur G. Rueckert.

SOURCE OF MUSEUM TECHNIQUE

Scene in a Chicago institution of the 1880's. Artists on a movable platform are shown painting one of the huge "battle panoramas" or "cycloramas" that drew crowds to two domed structures on Wabash Avenue before there were movies. One of the artists, the late Charles Abel Corwin, later came to the Museum and adapted the circular-wall painting technique for use in backgrounds of animal habitat groups.

The reader further interested in this bit of Chicago history should refer to "How a Great Battle Panorama Is Made," by Theodore R. Davis, in *St. Nicholas* (December, 1886, vol. 14, pp. 99–112).

KARL P. SCHMIDT
Chief Curator of Zoology

THIS MONTH'S COVER

(Photo courtesy of Herbert Knapp)

The gigantic figure that appears on our cover represents a spirit-guardian of a temple in Siam. It sets the tone of the color-film of that fascinating country which is the subject of the opening lecture, March 7, in this year's Spring Course in the James Simpson Theatre of the Museum. Herbert Knapp, of Los Gatos, California, well-known traveler and producer of documentary motion-pictures, will be the lecturer. Other lectures on far-off places will be given each Saturday afternoon through April 25. The titles and speakers for each date are on page 4.

Spring Visiting-Hours Begin

Visiting hours from 9 A.M. to 5 P.M. will go into effect at the Museum from March 1 through April 30, an extension of one hour beyond the 4 o'clock closing time observed during the winter months. A further extension to 6 P.M. closing will be made on May 1, to continue in effect through Labor Day, September 7.

Technical Publications

The following technical publications were issued recently by Chicago Natural History Museum:

Fieldiana: Zoology, Vol. 34, No. 6. *Secondary Sexual Characters and Ecological Competition.* By Austin L. Rand. November 12, 1952. 6 pages. $ .10

Fieldiana: Zoology, Vol. 34, No. 7. *More New Species and New Records of Fishes from Bermuda.* By Robert H. Kanazawa. November 20, 1952. 30 pages. $ .50

Fieldiana: Zoology, Vol. 34, No. 8. *On the Mollusk Fauna of the Land-locked Waters of Bermuda.* By Fritz Haas. December 18, 1952. 5 pages. $ .10

Fieldiana: Zoology, Vol. 34, No. 9. *South American Non-Marine Shells: Further Remarks and Descriptions.* By Fritz Haas. December 29, 1952. 26 pages. $ .60

MUSEUM BOTANIST TO EXPLORE VENEZUELA'S 'LOST WORLD'

AN EXPEDITION that will require hundreds of miles of travel afoot and by canoe in one of the world's loneliest and least-known areas—the famous "lost world" of southern Venezuela—will be undertaken early in March by Dr. Julian A. Steyermark, Curator of the Phanerogamic Herbarium of the Museum.

TABLE-TOP MOUNTAINS OF 'LOST WORLD'

This is the type of terrain that will be explored in Venezuela by a Museum expedition led by Dr. Julian A. Steyermark, Curator of the Phanerogamic Herbarium. The little-known and sparsely populated region has a distinctive flora, including many rare plants, and may yield new species.

The Venezuela Botanical Expedition will begin with the sailing of Curator Steyermark from New Orleans to La Guaira, port for Caracas, the capital, whence he will fly to a point of penetration of the "lost-world" area. After the plunge into this region, Curator Steyermark will be cut off completely for several months from civilization. He will have as field assistant one compatriot, Charles Griffin, a young northern Missouri naturalist, who will also collect birds and mammals for the Museum's Department of Zoology. The rest of the party will be native carriers, who are essential on an expedition of this kind because supplies and provisions for the entire period must be borne for the long overland treks on the backs of porters. It is estimated that the journeys afoot may total fully a thousand miles and involve climbing over bluffs to altitudes of 8,000 feet or more. The expedition plans to return sometime during the late summer.

PLAN TO EXPLORE SUMMIT

The primary object of the expedition is the exploration of Chimantá-tepuí, which, together with Acopán-tepuí, forms the largest of the table mountains in southern Venezuela, and the collection of its little-known flora. The region is the scene of Conan Doyle's *Lost World* and appears also in literature as the locale of *Green Mansions* by Henry Hudson. In the region is the world's highest waterfall—Angel's Falls of Mount Auyan-tepuí. One of the objectives of the expedition will be to reach the summit of Chimantá-tepuí and explore the hundreds of square miles on top because the flora and fauna there are believed to be very different from those at the base of the mountain or along the slopes. Camps will be made at various points at the base of the mountain, on its slopes, and on the summit.

Many of these tepuís have never been explored (tepuí is the local Indian word for mountain and is pronounced te-pwee). Isolated from the Andean chain on the west and northwest and from the Coastal Range (Cordillera de la Costa) on the north by hundreds of miles, they stand above the forested lowlands and grassy upland plateau, resembling the isolated buttes and table mountains of the western United States.

The base of these truncated masses may start at only 500 feet above sea level in the western part of the "lost-world" area or at 3,000 to 3,500 feet in the elevated eastern section, but their summits may be higher than 9,000 feet. They are roughly four-sided, although their form may be irregular. Their sides are precipitous sandstone bluffs thousands of feet high. Each mountain usually has two or three separate stories or levels of bluffs, each escarpment or bench being 1,000 to 2,000 feet of sheer precipice. Many of these tepuís have nearly vertical cliffs on all sides and, for this reason, have never been scaled. Others, like Mount Roraima, can be ascended only from one side.

The tepuís, which also extend on the west into southeastern Colombia and on the east merge into the sandstone mountains of British and Dutch Guiana, attain their most spectacular and extensive development in southern Venezuela. To date, each tepuí that has been explored has yielded a highly endemic flora and, to a less spectacular degree, fauna. Hundreds of new species of plants have been found as a result of exploring these table mountains. Many of the unusual plants growing in this area belong to primitive and isolated genera and families, related in a number of instances to groups found in Africa and Australia. In other cases their nearest relatives are species found in the Andes of western South America.

These tepuís have been cut off from the main Andean chain for a long time, geologically speaking, and are widely separated from the Andes by the level low llanos or treeless savanna-like areas. Since no fossils have been found to date, the age of the sandstone composing the tepuís is unknown. How long the tepuís themselves have been cut off from each other is also speculative. The fact that each of the tepuís has developed an isolated endemic flora and, in most cases, a fauna peculiar to it, poses a fascinating problem in evolution.

IMPORTANCE OF THE REGION

Botanists in general consider this area one of the most unusual in the world. In the Western Hemisphere it is believed that a greater number of new species of evolutionary significance remains to be discovered in this region than in any other part of the New World. For this reason the Museum is anxious to obtain as much material as possible for its herbarium.

During the past nine years, Dr. Bassett Maguire, Curator at New York Botanical Garden, and his colleagues have been exploring a number of these tepuís in Venezuela and British and Dutch Guiana. His most recent expedition, which has just left for the "lost world" of Venezuela, will explore Acopán-tepuí. The mountain being explored by his party joins the one (Chimantá-tepuí) to be investigated by Curator Steyermark. Therefore the botanical results of these separate expeditions will be published as a joint report by New York Botanical Garden and Chicago Natural History Museum.

During 1944 Curator Steyermark explored Mount Roraima, Mount Duida, Mount Ptari-tepuí, Sororopán-tepuí, and Carrao-tepuí. Several hundred new species were described as a result of the exploration of these mountains. It is expected that many interesting new species of plants will be discovered by the present expedition.

SATURDAY AFTERNOON TRAVEL LECTURES AND COLOR FILMS

ON SATURDAY afternoons in March and April, Members of the Museum, their guests, and the general public can sit comfortably in the James Simpson Theatre and, through the magic of color motion-pictures and the imagery of eloquent explorers and scientists, visit some of the world's far-away places.

The annual Spring Course, provided by the Edward E. Ayer Lecture Foundation Fund, will open on March 7 and continue on each Saturday afternoon in March and April. Lectures begin at 2:30 P.M. Limited accommodations make it necessary to restrict admission to adults. Special free motion-picture programs will be given for children on the mornings of the same Saturdays under the auspices of the James Nelson and Anna Louise Raymond Foundation.

Following is the complete schedule of this season's lectures for adults:

March 7—SIAM

Herbert Knapp

Siam, a land almost unchanged with the passing of the centuries, has a story-book capital in Bangkok that is a Venice of the Far East. Herbert Knapp, of Los Gatos, California, is well-known for his documentary color films of exotic lands. His present film takes the audience inside the Temple of the Emerald Buddha and to nearby gardens of luxuriant orchids. There is a trip by sampan through miles of floating houses and markets on Bangkok's traffic-choked canals and then through a tropical wonderland on the Chao Phya River, Siam's life-line to the outside world. Also shown are tribes in the mountains of the north, domesticated elephants at work in the teak forests, ancient court dances, and ritualized Siamese boxing that begins with a prayer and a dance and rewards the victor with flowers.

March 14—QUEBEC WILDERNESS COUNTRY

Earl L. Hilfiker

A vast wilderness area of breath-taking beauty lies to the north of the great Ottawa River in the northern part of the province of Quebec. In color films and vivid narrative, Earl L. Hilfiker, of Rochester, New York, presents a survey of this wild country with its dense timber growth, lakes, and streams. This is the homeland of the moose, beaver, spruce grouse, loon, and timber wolf, all of which play a role in the films. It is a fishing country to warm the soul of the most avid fisherman.

March 21—LAND DOWN UNDER

Alfred M. Bailey

It is always an event of special attraction for Museum audiences when Dr. Alfred M. Bailey, formerly a member of the staff of this institution and now Director of the Denver Museum of Natural History, returns, as he frequently does, to lecture here. This season he brings a color-film account of an expedition through New South Wales into tropical Queensland. Of all lands, Australia is perhaps the land of greatest contrasts, both in its native peoples and in its many strange animals.

March 28—AFRICAN LIFE

Julian Gromer

A journey of 8,000 miles by air to Lagos, in Nigeria, opens this lecture and color-film by Julian Gromer, world traveler and sportsman of Elgin, Illinois. At Lagos the armchair travelers find a harbor beautiful with graceful coco palms. People are seen casting their nets, making mud bricks, and cutting mahogany logs. Mr. Gromer takes his audience into the bush-country interior where the Chief of Lassa introduces his five wives. The film shows how a tribesman obtains a wife and how evil spirits are driven away by a medicine man. The audience also sees six hundred natives armed with poisoned arrows, spears, and leather shields and helmets in a battle over rights to a watering pool.

RESERVED SEATS FOR MEMBERS

No tickets are necessary for admission to these lectures. A section of the Theatre is allocated to Members of the Museum, each of whom is entitled to two reserved seats. Requests for these seats should be made in advance by telephone (WAbash 2-9410) or in writing, and seats will be held in the Member's name until 2:25 o'clock on the lecture day.

April 4—TIP-O-THE-MITTEN

Olin Sewall Pettingill, Jr.

The northern tip of mitten-shaped Lower Michigan with its magnificent forests, lush bogs and marshes, blue lakes, clear streams, and verdant farmlands is the setting of Dr. Olin Sewall Pettingill's film and lecture. Here at the University of Michigan Biological Station is unfolded a story of scientific study and discovery. The "action" of a "live" sand dune is studied with plant ecologists. The viewers are taken along with ichthyologists to track down the dreaded sea lamprey that has been ravaging Great Lakes fishes. The film documents the lives of mammals, birds, amphibians, insects, and plants, and it presents scenery of gorgeous splendor. Dr. Pettingill is an associate professor of zoology at Carleton College, Northfield, Minnesota.

April 11—IRAN

Kenneth Richter

Here is a film reputed to present the most complete picture sequence ever screened of a land in which the struggle of modern oil interests is carried on against the background of an ancient civilization. Kenneth Richter, of Bridgewater, Massachusetts, well known for his important social documentary films, shows the most modern achievements of engineering side by side with a handicraft civilization unchanged through the centuries. He introduces his hearers to the daily life of the people in the cities and of the primitive tribal organizations in mountain villages.

April 18—ADVENTURE IN BORORO LAND

Sasha Siemel

Known to the natives of Matto Grosso as the "Tiger Man" because of his exploits in hunting jaguars with spears and bow and arrow, Sasha Siemel in this lecture and film presents the story of Brazil's great ranches. He shows also the life of the primitive Bororo Indians who live on the edge of the cattle country. The Bororos are one of the few tribes that have retained their ancient dress and customs and have kept their blood free from mixture by the expedient of killing any child not typically Bororo. A feature of the movies is a colorful dance to placate the spirit of the jaguar.

April 25—LAND OF THE ANCIENT MAYA

Arthur C. Twomey

This lecture and motion picture presents the highlights of four expeditions to Honduras conducted by Dr. Arthur C. Twomey, curator of birds and director of education at the Carnegie Institute. Although his primary objective in the field was the study and collection of the varied and abundant tropical birds in the country's steaming jungles and dripping alpine rain-forests, he also deals with the life of the people. The ruins from which we derive our knowledge of the ancient civilization of the Mayas are the background for a large part of the film and lecture.

Daily Guide-Lectures

Free guide-lecture tours are offered at 2 P.M. daily except Sundays under the title "Highlights of the Exhibits." These tours are designed to give a general idea of the entire Museum and its scope of activities.

Special tours on subjects within the range of the Museum exhibits are available Mondays through Fridays for parties of ten or more persons. Requests for such service must be made at least one week in advance.

Although there are no tours on Sundays, the Museum is open to visitors as usual from 9 A.M. to 5 P.M.

'EXTREME ADJUSTMENTS' FOUND IN CHAMELEONS

By CHRISTINE TARDY
BULLETIN STAFF WRITER

A FEW WEEKS AGO, a box arrived at the Museum from Madagascar, that island off the east coast of Africa that has been the source of a large number of zoological surprises. When Dr. Karl P. Schmidt, Chief Curator of Zoology, and excited members of his staff gathered around to open the package, out crawled a green gecko, a series of skinks, and three magnificent chameleons.

Two of the chameleons were extraordinary. If you remember the little creatures you bought at carnivals in your childhood, the tiny lizards that would sit on your shoulder and change color every so often (they called them chameleons, but they aren't—they're actually anoles, a type of American lizard), then you will know the zoologists' reactions when they got a look at some of the biggest chameleons in the world. Unfortunately, the trip by air-express had been too much for the larger of the two big ones and it died the day it arrived, but the other big one—18 inches long—took at once to its new environment and promptly proceeded to feast on cockroach and spider delicacies with zest.

Chameleons are the most short-lived of all reptiles, with a life-span of only two or three years, and it is impossible to judge the age of an adult. So, because the surviving big one, a *Chamaeleo lateralis*, and the other smaller *Chamaeleo pardalis* seemed to be thriving so well, Dr. Schmidt decided to turn them over to Brookfield Zoo until they choose to die and return to the Museum in a preserved state to be studied. To the best of the Museum zoologists' knowledge, the big *lateralis* is the only one ever to come to this country and stay alive; so everyone is anxious to keep it that way.

THEY'RE 'EXTREMISTS'

The built-in aurora borealis isn't the only thing that makes chameleons interesting. As Dr. Schmidt says, "they're bundles of extreme adjustments." They possess remarkable projectile tongues, eyes that pivot in any direction independently of each other, feet like tongs made for grasping branches but quite useless on the ground, and prehensile tails.

Most of these features are aids in feeding, since the tastes of chameleons are limited to spiders, grasshoppers, and other insects. Chameleons are very slow-moving creatures, and their excessively slow movements are exactly what is required for stalking their prey. They will sit on branches almost motionless, and their coloring is so adaptive that they look like part of the branch. But when an unsuspecting insect alights nearby, it is doomed to be swept into the chameleon's stomach in a fraction of a second. When he sits still, the chameleon fools insects into thinking him part of the scenery. His pivot eyes may be his only moving parts, and they make a strange thing to watch. The eyes move independently of each other except when the chameleon finds it convenient to focus them both at the same time on the same object—and then he seems to have stereoscopic or binocular vision, to judge from the accuracy of his aim with his projectile tongue.

When the chameleon sights a likely looking morsel in this way, the next thing to occur happens so fast that it's hard for the human eye to follow. Its very long tongue, twice as long as its body, tipped with a sticky, weighty knob, darts out an amazing distance to adhere to the prey and pull it back into the mouth.

GIANT CHAMELEON OF MADAGASCAR
This rare creature, held by Hymen Marx, Assistant in the Division of Amphibians and Reptiles, is 18 inches long and one of the largest chameleons ever to reach this country. It is of the species Chamaeleo lateralis. The animal will live out its life at Brookfield Zoo and then will be preserved at the Museum.

The chameleon gets a good grip on the branch or twig by grasping it with its peculiar tong-like feet. On each foot, two toes lie on one side and three on the other, and these groups of toes are opposed. The tail serves as a fifth grasping organ and may be wrapped around the twig also. The feet are not at all adapted for a life on the ground, and this is why chameleons are found around woody vegetation. Otherwise, they are found in all kinds of climates and habitats, each adapted to its particular environment and different from those of other environments. This is not to say that they are found everywhere, however—of the genus *Chamaeleo*, half the species are found only on Madagascar, while Arabia has two species, India has one, and Africa has the rest. The common species, known even to Aristotle, has spread along the Mediterranean coasts to Spain and Palestine.

ISOLATED HABITAT

Madagascar became isolated from the course of events going on in evolution elsewhere, as did Australia, and as a result it is a sort of refuge. The island was cut off in the earliest era of the age of mammals. It has lemurs but no monkeys, harmless snakes—no poisonous ones. There are plenty of insectivores but few carnivores and no hoofed animals except for the wild pigs that are thought to have swum over. Hence, working with what she had, nature produced more variations of the insectivorous chameleon on Madagascar than have managed to survive evolution anywhere else in the world.

EMOTION CAUSES COLOR CHANGE

The *lateralis*, while at the Museum, was observed to maintain a very dark uniform green color—this when it wasn't excited or upset about anything. If the color of its background changed with no other accompanying disturbance, the *lateralis* would slowly take on a suitably blending color. But if it encountered some disturbance such as sudden motion, then fear or anger would cause it to change color very rapidly and radically—the most spectacular offering observed was a change to orange with white stripes down the sides. This latter type of color change is caused by a hormone-stimulated reaction, while the former type seems to be controlled through the eyes and the central nervous system.

These amazing reptiles were sent to the Museum by a former student of Dr. Schmidt's at the University of Frankfurt where Dr. Schmidt taught in 1950. This German zoologist, Karl Ludwig Koch, made an expedition to Madagascar late in 1952 to collect specimens of the peculiar Madagascar fauna for various European zoos and museums. His interest is mainly in reptiles and amphibians, and this Museum requested specimens of which the present series is an installment.

ILLINOIS AUDUBON SOCIETY LECTURE ON MARCH 22

"Bonaventure Diary," a lecture illustrated with color motion-pictures, will be given on Sunday afternoon, March 22, at 2:30 o'clock in the James Simpson Theatre of the Museum under the auspices of the Illinois Audubon Society. Robert C. Hermes, photographer for a Royal Ontario Museum expedition, will be the lecturer. His narrative and film tell the story of the great bird colony of Bonaventure Island in the Gulf of St. Lawrence, just three miles north of Gaspé Peninsula. Among birds shown in the film are gannets, kittiwake gulls, murres, puffins, and razor-billed auks. The public is invited, and admission is free. Members of the Illinois Audubon Society and of the Museum may have seats in the reserved section of the theatre upon presentation of their membership cards to the ushers, but reserved seats must be claimed not later than 2:25 P.M.

ONE OF THE SPINDLE-TREES, A NATIVE OF KOREA

By EMIL SELLA
CURATOR OF EXHIBITS, BOTANY

A striking new model, a fruiting branch of an Oriental spindle-tree, has recently been added to the synoptic exhibits in Martin A. and Carrie Ryerson Hall (Plant Life, Hall 29). Native to Japan and Korea, this attractive spindle-tree, *Euonymus hamiltonianus* var. *yedoensis*, was introduced as an ornamental in the Western World at the beginning of the present century. The living material was obtained from the Morton Arboretum near Lisle, Illinois. The prepared model is the result of combined efforts of Preparator Frank Boryca, Artist-Preparator Samuel Grove, Jr., and the writer.

A NEW EXHIBIT IN DEPARTMENT OF BOTANY

Close-up of fruits on branch of an Oriental spindle-tree (Euonymus hamiltonianus var. yedoensis). This reproduction, prepared by Emil Sella, Curator of Exhibits in Botany, may now be seen in Martin A. and Carrie Ryerson Hall (Plant Life, Hall 29).

This small tree with handsome opposite leaves produces clusters of unpretentious greenish-white flowers that appear in the month of June. This modest early appearance is more than made up as the fruit ripens in the latter part of September. The colorful display of its four-celled rosy-pink capsules becomes even more attractive as the capsules partly open and reveal small oval aril-covered seeds of brilliant crimson color. The numerous hanging clusters of fruits persist even after the leaves have fallen, retaining their colors until hit by hard frost.

The generic name Euonymus, often spelled Evonymus, is the classical name of one of the European species. Including various forms of deciduous and evergreen shrubs and small trees, this genus is widely distributed through the northern hemisphere extending occasionally south of the equator to the islands of the Indian Ocean and to Australia. However the largest number of these trees and shrubs occurs in the warm regions of southern Asia.

Many species and varieties are grown as ornamentals. Being hardy and not particular as to soils, they are well adapted for shrubberies, while some evergreen species are used for hedges. Propagation is by seeds or by cuttings of mature wood in the fall.

The spindle-tree is closely related to the climbing bittersweet, *Celastrus scandens*, a woody vine found in the rich woods of eastern North America. A model of the latter has been on display in Hall 29 for a number of years and may now be seen together with this Oriental spindle-tree in Case 869.

Girl Scouts Study at Museum

On Saturdays during February, Girl Scouts in groups of as many as two-hundred girls came to the Museum for nature studies, with the staff of the Raymond Foundation as instructors. After meetings in a lecture room, the girls were conducted on tours of exhibits by their Museum guides. The studies were for the purpose of aiding them in attaining Girl Scout nature-proficiency badges.

Books

(All books reviewed in the BULLETIN *are available in The Book Shop of the Museum. Mail orders accompanied by remittance including an allowance for postage are promptly filled.)*

PLANTS, MAN AND LIFE. By Edgar Anderson. Little, Brown and Company, Boston, 1952. 245 pages. Price $4.

This is one of the best books on plants to appear for a long time. The author, Edgar Anderson, assistant director of the Missouri Botanical Garden and one of the most prominent figures in plant research, is distinguished for his ability to arouse interest in new methods and fields of research. He has a simple story to tell but a story so linked with the habits and migrations of man that it involves such seemingly unrelated personalities as a Mexican farmer who grew several kinds of corn, an American botanist who could find no place to keep all his specimens, and a Russian geneticist who was liquidated.

We know less about our cultivated plants and the weeds that follow man, Dr. Anderson says, than we do about the wild flowers and birds of many remote places. Even scientists who can name plants collected in Guatemalan mountains or the jungles of South America are baffled by and have little interest in common garden plants and weeds that have been associated with man for thousands of years. Fortunately, a few botanists recognize the need for a better understanding of our useful plants and have begun to study them. The methods they developed and the difficulties and adventures they encountered in applying their methods form the most interesting parts of the book.

The routine followed in field work and in laboratory research on useful plants and weeds is described fully but simply so that the layman can readily understand not only the methods used but also the significance of the results. For the benefit of any readers who want detailed information on our cultivated plants, one chapter outlines the status of our present knowledge of useful plants, and suggested readings are listed, with comments, at the end of the book.

This is a book that every person interested in nature and in the products of man's intelligence and skill should read. Living things and artifacts are usually considered unrelated; yet Dr. Anderson brings out not only the importance of plants in the development of man but also the transformation man has wrought on many useful plants and on weeds as well.

PAUL S. MARTIN
Chief Curator of Anthropology
and HUGH C. CUTLER

Fishing Notes From All Over . . .

LAKE MICHIGAN IS CALLED AN 'AQUATIC DESERT'

In conversation, the staff of the Department of Zoology often refers to Lake Michigan as an aquatic desert. We think of it as a sparsely populated habitat—excluding, of course, the human population. Deep, relatively cold bodies of fresh water, such as our Great Lakes, are not rich in animal life.

On the other hand, shallow, warm lakes in the tropics may swarm with life. One such place, the Great Lake of Cambodia, Indo-China, has a fantastic fish crop. Great Lake lies in the lower part of the Mekong River basin. Every spring the lake overflows its banks until it reaches four times its low-water surface area. This tremendous increase in size is brought about by the coincidence of the rainy season in Indo-China with the swelling of the Mekong River by the melting snows of the Himalayas 2,300 miles upstream.

Dr. P. Chevey of the Oceanographic Institute of Indo-China estimates the annual fish catch of Great Lake to be 100,000 tons, of which 23,000 tons are exported to Java. As the total surface area at high water is 3,800 square miles, the annual yield is about 26 tons per square mile. The surface area of Lake Michigan is 22,400 square miles. In 1946, a moderately good fishing year, 11,192 tons of fish were caught in Lake Michigan, or roughly one-half ton per square mile.

As we say, it's an aquatic desert.

ROBERT F. INGER
Assistant Curator of Fishes

DALLWIG RESUMES TALKS ON SUNDAY AFTERNOONS

Returning from a month's out-of-town speaking tour, Paul G. Dallwig, the Layman Lecturer, will resume his Sunday afternoon talks at the Museum in March. His subject for the month is "A Museum Zoo Is Exciting Too," to be presented at 2 P.M. on all five Sundays—March 1, 8, 15, 22, and 29. The lecture, given partly in the Lecture Hall and partly among exhibits, covers incidents in the lives of wild animals that illustrate their intelligence and behavior under varied conditions. Among especially famous animals in the Museum whose stories will be told are the gorilla Bushman, the giant panda Su-lin, and the man-eating lions of Tsavo. A feature of the lecture is a dramatization of a day in Africa.

Members of the Museum may use their membership cards to attend these lectures without advance reservations. All others, with the exception of accredited representatives of the press, must make reservations in advance. Reservations may be made by mail or telephone (WAbash 2-9410). The lectures are free. They start promptly at 2 P.M. and end at 4:30 P.M., including a half-hour intermission for relaxation or for tea or coffee in the Museum cafeteria, where smoking is permitted. Admission is restricted to adults.

GIFTS TO THE MUSEUM

Following is a list of the principal gifts received during the past month:

Department of Anthropology:

From: Theodore Nakutin, Chicago—fur parka, Alaska

Department of Botany:

From: Prof. Eizi Matuda, Chiapas, Mexico—134 phanerogams, Mexico; Claude R. Mowry, Reno, Nev.—*Pinus washoensis*, *Quercus washoensis*, Nevada; O. A. Oaks, Wilmette, Ill.—plank of Fijian *Kauri*, plank of *Podocarpus*, Fiji Islands; Floyd Swink, Chicago—412 phanerogams, Indiana and Illinois

Department of Geology:

From: L. J. Blanchard, Bakersfield, Calif.—Horse Canyon agate, California; Mrs. Marion Rubens, Chicago—double strand seed-pearl necklace; Dr. William B. Thomas, Lyons, N.J.—collection of fossil fishes and concretions, Greenland

Department of Zoology:

From: American Museum of Natural History, New York City—3 weevils, South America; Bernard Benesh, Burrville, Tenn.—2 pupae of *Dynastes tityus* (rhinoceros beetle), Tennessee; Chicago Zoological Society, Brookfield—mammal specimen; Luis de la Torre, Ann Arbor, Mich.—94 ectoparasites of mammals, Guatemala; Dr. Georg Haas, Jerusalem, Israel—2 worm snakes, Israel; Harry Hoogstraal, Cairo, Egypt—2 frogs, 14 bats, Egypt, Giza, and Abu Sir; Richard I. Johnson, Belmont, Mass.—collection of fresh-water clams, New England states; Dr. Juan A. Rivero, Mayaguez, Puerto Rico—2 coral snakes, Venezuela; Dr. Wolfgang Weyrauch, Lima, Peru—collection of shells, Peru

NEW MEMBERS

The following persons became Museum Members from January 19 to February 11:

Contributor

Dr. Harold Trapido

Associate Members

Hamilton Allport, Dr. Abraham Goldstein

Annual Members

Arthur J. Bidwill, Mrs. Herbert A. Borland, Dr. Stanley Budrys, Raymond Canaday, Theodore Chandik, Bernard J. Cunningham, Dr. Leonard F. Farrell, Harry N. Gifford, Jr., Brimson Grow, Milan Herzog, William H. Hillier, John L. Hopkins, Rajko Lozar, Mrs. Frederick Orr Ludlow, Merrill W. MacNamee, Frederick Mayer, Fritz Mayer, L. R. O'Brien, Martin T. O'Brien, William L. O'Brien, L. O. Paul, Charles D. Peacock III, Ralph Pellow, Herbert J. Pulham, Miss Sadie Purvis, W. J. Stark

On Saturday Mornings . . .

FREE MOVIE PROGRAMS OFFERED CHILDREN

A series of eight free motion-picture programs for children will be presented at the Museum on Saturday mornings during March and April. On four of the programs, explorers who are to appear also in the spring lecture course for adults will tell their stories for the children.

The children's programs, under the auspices of the James Nelson and Anna Louise Raymond Foundation, will be given at 10:30 A.M. in the James Simpson Theatre. Children may come alone, accompanied by parents or other adults, or in groups from schools, clubs, and other centers. No tickets are needed. Following are the titles and dates of the programs:

March 7—DESERT LIFE

One film on American southwestern deserts and the Indians; a second film on desert of French Morocco and its people

Also a cartoon

March 14—THE RABBIT THAT RUNS ON SNOWSHOES

Movies of the snowshoe hare, one of nature's most fascinating creatures, with story told by Earl L. Hilfiker

March 21—ARIZONA

All seasons in color film; life of the Indians; the Grand Canyon. Alfred M. Bailey will tell the story

March 28—SPRING COMES TO A POND

The first frogs, small mammals, birds, and flowers that appear in the Chicago region

Also a cartoon

April 4—WILD LIFE IN ACTION

Strange and comical behavior of birds, mammals, reptiles, and other creatures, with Olin Sewall Pettingill, Jr., as storyteller

April 11—ALASKAN ESKIMOS

Films by Walt Disney of an Eskimo and his family

Also a cartoon

April 18—ADVENTURE IN BORORO LAND

The story of cowboys and Indians in the Matto Grosso region of Brazil. Sasha Siemel, who made the film, will narrate his adventures, including wild-animal hunts

April 25—OLYMPIC ELK

One of Walt Disney's True Life Adventure Series

Also a cartoon

Egypt's ancient culture from before 3000 B.C. is illustrated in Hall J.

PRIZE WINNERS IN THE EIGHTH INTERNATIONAL NATURE PHOTO EXHIBITION

'INTO NOWHERE'

By Charles Wilson, of San Diego. Awarded silver medal first prize in the General Section of Nature Photography Exhibition.

'BUBBLE BLOWER'

By Louis Quitt, of Buffalo. Awarded silver medal first prize in the Animal-Life Section of Nature Photography Exhibition.

'LEAF PATTERN'

By M. M. Deaderick, of Carpenteria, California. Awarded silver medal first prize in Plant-Life Section of Nature Photography Exhibition.

On this page are reproduced the photographs that won the first prizes—silver medals—in the animal-life, plant-life and general sections of the Division of Prints in the Eighth Chicago International Exhibition of Nature Photography. The exhibit was held in Stanley Field Hall from February 2 to March 1 under the auspices of the Museum and the Chicago Nature Camera Club.

Following are lists of medal winners and awards of honorable mention:

MEDAL WINNERS

Prints:

ANIMAL-LIFE SECTION: Louis Quitt, Buffalo, N.Y.—*Bubble Blower*

PLANT-LIFE SECTION: M. M. Deaderick, Carpenteria, Calif.—*Leaf Pattern*

GENERAL SECTION: Charles Wilson, San Diego, Calif.—*Into Nowhere*

Color Slides:

ANIMAL-LIFE SECTION: Louis Quitt, Buffalo, N.Y.—*Dragonfly Clinging to Noiod Case*

PLANT-LIFE SECTION: Leota Otis Kisor, Olympia, Wash.—*Amanita muscoria*

GENERAL SECTION: James Y. T. Leong, Honolulu, Hawaii—*Kilauea Eruption*

HONORABLE MENTIONS

Prints and Color Slides, All Sections

CHICAGO AREA

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OUTSIDE OF CHICAGO AREA

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SPECIAL MEDALS FOR COLOR SLIDES

Awarded by the Photographic Society of America

Dr. William W. Tribby, Memphis, Tenn.—*"Mud Pattern"*; V. E. Ward, Angels Camp, Calif.—*"Growth on Stone"*

STAFF NOTES

Dr. Karl P. Schmidt, Chief Curator of Zoology, gave a series of lectures on animal geography at the University of Toronto last month and spoke before the Royal Canadian Institution on "A Naturalist's Glimpse of Peru." On February 22 he appeared as a member of a panel of zoological authorities to identify animals by their voices on the Chicago-originated network-television program "Zoo Parade" (WNBQ-NBC) . . . . **Mrs. Jean Shultz** has been appointed a lecturer on the staff of the Raymond Foundation filling the vacancy caused by the resignation of **Mrs. Jane Monson.** Mrs. Shultz, whose specialty is zoology, is a graduate of Principia College, Elsah, Illinois. She has had previous museum lecturing experience . . . . **Miss Christine Tardy** has been promoted to Associate Public Relations Counsel after having served since November, 1951, as assistant to **H. B. Harte** (who continues as Public Relations Counsel). Miss Tardy, a frequent contributor of BULLETIN feature articles, has been given special duties in radio and television activities . . . . **Eugene S. Richardson, Jr.,** Curator of Fossil Invertebrates, will appear Monday, March 2, at 7:30 P.M. on the television program "This Wonderful World" over station WENR-TV. Four members of the Raymond Foundation lecture staff—**Miss Miriam Wood, Miss Harriet Smith, Miss Marie Svoboda,** and **Miss Nancy Worsham**—have recently brought Museum information to television viewers on five different programs over stations WNBQ and WGN-TV . . . . **Miss Lillian A. Ross,** Associate Editor of Scientific Publications (and Associate in the Division of Insects), is collecting spiders for the Museum collections while on a trip of several weeks in Mexico. . . . . **Dr. Julian A. Steyermark,** Curator of the Phanerogamic Herbarium, was guest-star February 22 on "Press Conference," television program over WGN-TV. He was interviewed on his expedition to the "lost world" of Venezuela by a panel consisting of Robert Northshield of the *Sun-Times,* Lloyd Wendt of the *Tribune,* Arthur Snyder of the *Daily News,* and Ross de Lue of the *Herald-American.* Lee Schooler was moderator of the program.

More than 1,000 examples of carved Chinese jade, from about 1500 B.C. to the end of the 19th century, may be seen in Hall 30.

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BULLETIN
Vol. 24. No. 4 - April 1953
Chicago Natural History Museum

Collared Aracari of Mexico

(See page 3)

Chicago Natural History Museum

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Members are requested to inform the Museum promptly of changes of address.

ADVICE ON SCIENTIFIC WRITING

As editor and consulting editor and member of editorial boards, I long ago found it a useful defense to have at hand a slip on which was printed Charles Darwin's advice to a young colleague. This charming quotation provides support of an unimpeachable kind to my own editorial policy and practice, a support often needed. The enclosure of Darwin's words with a manuscript sent back to be rewritten in shortened form has, I hope, sometimes softened the blow to a young contributor who finds himself at the beginning of a task he had thought finished. The quotation, from a letter to John Scott dated December 11, 1862, is as follows:

"I have read your paper with much interest. You ask for remarks on the matter, which is alone really important. Shall you think me impertinent (I am sure I do not mean to be so) if I hazard a remark on the style, which is of more importance than some think? In my opinion (whether or not worth much), your paper would have been much better if written more simply and less elaborated—more like your letters. It is a golden rule always to use, if possible, a short old Saxon word. Such a sentence as 'So purely dependent is the incipient plant on the specific morphological tendency' does not sound to my ears like good mother-English—it wants translating. Here and there you might, I think, have condensed some sentences. I go on the plan of thinking every single word which can be omitted without actual loss of sense as a decided gain. Now perhaps you will think me a meddling intruder: anyhow, it is the advice of an old hackneyed writer who sincerely wishes you well."

The letter reflects an unfailing aspect of the character of Charles Darwin—his unwillingness, in however small degree, to hurt the feelings of his young correspondent. Perhaps the manner of the suggestions needs to be called to the attention of editors as much as the advice itself needs to be set forth to would-be writers.

KARL P. SCHMIDT
Chief Curator of Zoology

SOMETIMES TRILLIUMS ARE QUADRILLIUMS

Do you know the beautiful white spring flower of the lily family, the white trillium? It is to be found in moist woodland in all of northeastern North America. Most of the lilies have their flower parts in threes, and the trillium almost always has three leaves on its single stalk, three green sepals and three white petals in its flower, with six stamens with their yellow pollen and three greenish stigmas inside. Just as there are four-leafed clovers, when all normal clovers have three leaves, so there are "quadrilliums," ordinary trilliums with all the parts in fours—four leaves, four sepals, four petals, eight stamens, and four stigmas. There are a great many other varieties of the white trillium—some with the flower all green, some with the sepals turned into petals, and beautiful double ones, like white roses. If you know a woods where the trilliums bloom, hunting for these strange varieties is a fascinating game for May.

KARL P. SCHMIDT
Chief Curator of Zoology

SHIPMENT OF SPECIMENS IN DRY ICE TESTED

Ten piranhas or "cannibal fish" caught in the Paraguay River in the state of Matto Grosso, Brazil, arrived recently at the Museum packed in dry ice.

Arrangements for the shipment were made by Henry L. Cook, vice president of the Liquid Carbonic Corporation, Chicago, on a recent visit to Brazil. Dry ice was sent by air and boat to the location where fishing was in progress. Immediately after being caught the fish were quick-frozen in dry ice which has a temperature of 110 degrees below zero (Fahrenheit).

By air the shipment could have been delivered in Chicago within about four days, but it was deliberately delayed in transit for a few additional days to obtain more complete data on the merits of the packing method. Upon arrival and unpacking at the Museum, the fish specimens were found to be well preserved and to have retained their life colors.

The particular species of piranha received, attaining lengths up to about 10 inches, happens to be of the most ferocious type called "man-eating." Schools of them are famed for deadly attacks on animals and human beings fording streams or swimming in them.

MUSEUM HOLDS CLASSES FOR CAMP LEADERS

Several hundred camp counselors of the Chicago area attended a nature course conducted in all-day sessions at the Museum on March 17, 24, and 31. The instructors were members of the James Nelson and Anna Louise Raymond Foundation's lecture staff. The course was sponsored by the day camp committee of the Chicago Camping Association. Subjects covered included plants, insects, reptiles, amphibians, mammals, birds and their calls, fossils, mineralogy and Indian lore. Lectures on these subjects were supplemented by open discussions, tours of Museum exhibits, and work in small groups. Raymond Foundation lecturers who conducted classes were Miss Miriam Wood, Miss Dolla Cox, Miss Marie Svoboda, Miss Edith Fleming, Miss Nancy Worsham and Miss Harriet Smith.

Antioch College Pays Tribute To Museum Service

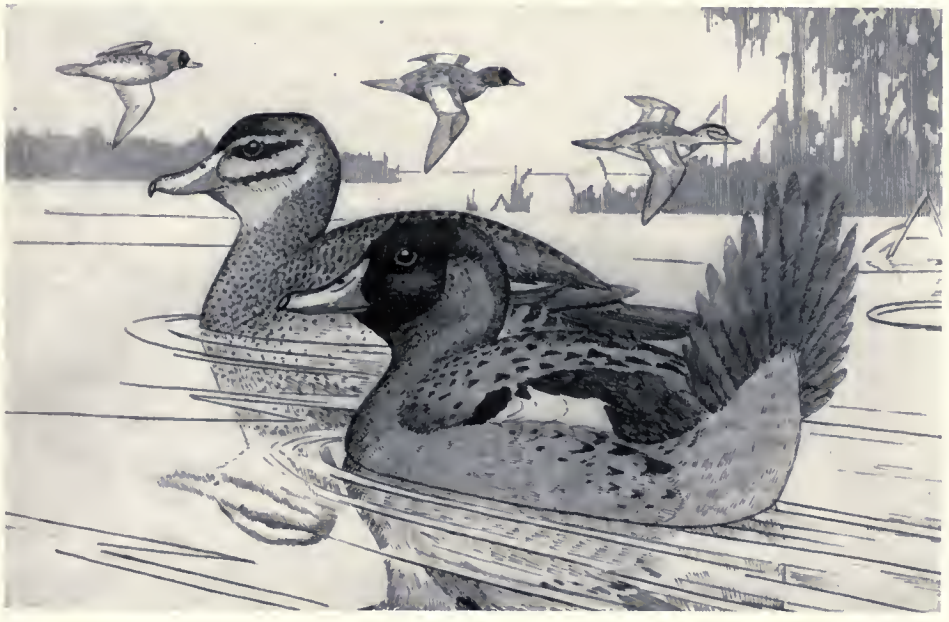
For its co-operation in a "study-work-and-earn" plan for college students, Chicago Natural History Museum has been awarded a certificate of recognition by Antioch College in Yellow Springs, Ohio. Students at Antioch divide their school year between periods of formal classroom work on the campus and on-the-job training in various types of businesses and institutions all over the country. The Museum has been participating in this program since 1946, and has given temporary employment to seventy-two students. Some of these young men and women have been employed in the scientific departments of the Museum, while others have assisted in junior capacities in the administrative offices. The plan is still in operation, and several Antioch students are currently employed.

Belfast Museum Aide Here

George Thompson, Keeper of the Ethnographic Section of the Belfast Municipal Museum and Art Gallery, Belfast, Ireland, is spending several months at Chicago Natural History Museum. He is in this country on a Fulbright grant to make a study of American museological methods. The Belfast museum includes natural history as well as ethnography and art.

MUSEUM CURATOR IS AUTHOR OF GUIDE TO MEXICAN BIRDS

EMMET R. BLAKE, Associate Curator of Birds at Chicago Natural History Museum, is the author of *Birds of Mexico, A Guide for Field Identification*, a book of more than 650 pages scheduled for publication April 10 by the University of Chicago Press. The book is lavishly illustrated by Douglas E. Tibbitts, Staff Artist of the Museum.



MASKED DUCK

Male in front, female behind. One of the illustrations by Douglas E. Tibbitts in "Birds of Mexico."

For a long time there has been a distinct need for a book of this type describing and illustrating the remarkably rich and varied bird fauna that populates Mexico. Almost one-eighth of the species known in the world have been found within its political boundaries. Influenced both by the temperate north and by the tropical south, Mexico's bird life far exceeds in number of forms that of the United States and Canada combined. Generations of ornithologists have studied Mexican birds, and specimens numbered in the scores of thousands are preserved in museums the world over as material for research. Yet, so large is the fauna and so complex its origins, relationships, and distribution that our knowledge of Mexican birds today is roughly comparable to what was known about the bird life of the United States three-quarters of a century ago.

NEARLY 1,000 SPECIES

Almost 1,000 species of birds and more than twice as many geographical varieties, representing 89 families, have been found within Mexico's political boundaries. This total, remarkable for a country lying largely in temperate regions, includes more than 750 resident species and about 200 winter visitants and transients of regular occurrence. While many of the residents are also represented in the United States, more than 80 species live only in Mexico, and some 400 others do not range beyond its northern border. Obviously, Mexico affords unique opportunities for bird study, both for the novice and for the specialist.

In recent years increasing numbers of Americans have looked to the tropics, especially Mexico, for new experiences in bird study. Completion of the Mexican portion of the Pan American Highway now provides easy access from the north, and today hundreds of thousands of tourists spend their vacations in our sister republic. Many ask museum ornithologists to recommend suitable bird guides for the areas to be visited. Until recently Sturgis' *Field Book of Birds of the Panama Zone* (1928) has had to serve the whole of Middle America north to our southern border.

The publication in 1950 of George M. Sutton's *Mexican Birds, First Impressions*, was a welcome boon for those who wish to study Mexican bird life, but the need for a comprehensive field guide remained. This need encouraged the preparation of the forthcoming handbook, *Birds of Mexico*. Written primarily for the bird watcher, it treats all of the 967 species that have been recorded from the Mexican mainland (including Baja California), the adjacent waters, and associated islands. Although essentially a guide for Mexico, and arbitrarily limited to the birds of that country, it will serve almost equally well in Guatemala and elsewhere in northern Middle America.

AIDS SIGHT IDENTIFICATION

The scope and content of the book are suggested by the title. Its primary objective is the sight identification of birds in their natural habitat. Emphasis is placed on the more conspicuous diagnostic characters, and attention is directed to aspects of seasonal status, distribution, habitat, or song that serve to facilitate or corroborate the identification. The Mexican distribution of each species and geographical variety is briefly outlined and comparisons are often made with birds that are superficially similar. The simple keys to conspicuous field characters, and text descriptions of plumages are augmented by 329 detailed line-drawings.

THIS MONTH'S COVER

Our cover is an enlarged reproduction of the frontispiece in the forthcoming handbook, "Birds of Mexico, A Guide for Field Identification," which is discussed on this and other pages. It shows a collared aracari, most abundant of the three kinds of toucans found in Mexico. All members of this characteristic tropical American family have notably large bills which appear heavy but actually are quite light because of their cellular internal structure. Toucans inhabit wooded regions, chiefly in tropical lowlands, and are essentially birds of the forest crown. They are fruit-eaters and, like woodpeckers, nest in cavities in trees. The species illustrated ranges from southern Mexico to Colombia and Venezuela.

EXPEDITION TO PERU

The Zoological Expedition to Peru, 1953–54, in charge of Celestino Kalinowski of the Department of Zoology will leave Chicago on April 12. Mr. Kalinowski will spend one year in south central Peru collecting mammals and birds in the mountains and foothills between Junin and Cuzco.

A Peruvian by birth, Mr. Kalinowski was trained by his father, who was a well-known collector for the British Museum (Natural History). He has made valuable collections from the area near his home in the forest of southeastern Peru.

This year's expedition carries on the mammal survey of Peru begun in 1912 by the late Dr. Wilfred H. Osgood, former Chief Curator of Zoology, and continued by the Museum through other members of its staff and independent collectors.

Author and Artist . . .

BLAKE FASCINATED BY BIRDS SINCE BOYHOOD; TIBBITTS' ILLUSTRATIONS IMBUED WITH LIFE

(*A description of the new book,* BIRDS OF MEXICO, *appears on page 3.*)

BY AUSTIN L. RAND
CURATOR OF BIRDS

WHAT MANNER OF MAN is this who writes a book about Mexican birds? The fact that he's six foot two, weighs 190 pounds, is fortyish, graying, and wears horn-rimmed spectacles and an affable smile tells us little because naturalists, like sprinters, come in various sizes and shapes.

The frequency with which the Museum is asked, "How does one become a naturalist?" leads me to probe into the background of this one. To most naturalists the urge to study natural history comes early. The bent of the twig determines the shape of the tree. So it was with Emmet Reid Blake—"Snakey" to his boyhood friends in South Carolina; Emmet to his teachers; and Bob to his intimates. At the age of four, under his mother's direction, he was feeding the young sparrows in a nest in the attic window of their Greenwood home. At the age of ten he was skinning and "stuffing" birds under the tutelage of a distant relative, and assembling his own museum.

EMMET R. BLAKE
The author of "Birds of Mexico" at his desk.

At Presbyterian College in Clinton, South Carolina, the sympathetic guidance of his professors, especially Dr. Marshall W. Brown, history professor, and the late Dr. Frank Dudley Jones, who also had a deep interest in natural history, allowed Bob to develop his main interests. He gathered material for another museum. Room was found for this in a dormitory awaiting modernization, and over the door in a dramatic pose was placed a buzzard that came to bear the name of one of the less popular professors.

A sound physique is an advantage to any man, but to a naturalist-explorer who will penetrate distant jungles in strenuous and even dangerous travels, it is necessary. We find Bob taking boxing lessons as a boy, excelling at track, and winning boxing titles. Once, on a summer vacation from college, he found himself in a Florida carnival where a professional boxer offered a purse of $75 to anyone who could stay four rounds with him. Bob not only stayed four rounds, but knocked out the pro. Though it hardly comes under the heading of track, there's a story that Bob, returning from South Carolina to Pittsburgh where he was doing graduate work, covered the 900 miles on roller skates, as an economical method of travel.

A naturalist alternates his periods of travel and activity with periods of quiet research in the seclusion of a museum study. As a student Bob excelled only in biology. Other subjects didn't interest him. But his writing began early. When he was ten a roost of thousands of purple martins occupied the Greenwood square. The townspeople thought them a nuisance. The firemen, armed with shotguns, sought to abate the nuisance by a frightful slaughter. This so perturbed Bob that he wrote a long letter of protest to the local press, a letter that, published in full, put the ten-year old lad in embarrassing limelight.

One thing a naturalist needs above all is tenacity of purpose, and to find his reward in work well done. With a B. A. degree from Presbyterian College, only one thing was obvious to Bob. He was going to work in a museum. The need for a higher degree was a corollary, as was the need for part-time, paying employment. Pittsburgh had a museum, a university, and a Y. M. C. A. where Bob had a half-promise of a job as boxing instructor. There he went. Then came a period that was a kaleidoscope of museum experience, taking university studies and art work, a graduate instructorship in zoology, giving boxing and swimming instructions, and doing remunerative odd jobs. Here he first came under the influence of professional naturalists: W. E. C. Todd, now Curator Emeritus of Birds of the Carnegie Museum at Pittsburgh, and Rudyerd Boulton who later came to be Curator of Birds at Chicago Natural History Museum.

FIRST VENTURES IN FIELD

Many a naturalist got his start in his chosen field by going on an expedition. By now Bob knew how to prepare museum specimens, and he knew what museums wanted. Bob's chance came to go to Brazil and Venezuela on a National Geographic Society expedition which needed someone who could collect. It meant interrupting his schooling, but that was of minor importance. He went into the tropics, fortunate in having the veteran naturalist-explorer, Ernest Holt, as leader of the expedition to initiate him into jungle ways. That the collecting, the long days on the trail and the long hours preparing specimens agreed with Bob, and that he was a success, we can judge by the fact that a few months after his return he received and accepted a chance to head an expedition to Venezuela for our Chicago museum (then called Field Museum of Natural History). There, on one little-known mountain called Turumiquire, he made what may be a record: single-handed he collected 803 birds, 96 reptiles, and 37 mammals in 35 days.

Returning and completing his master's degree at the University of Pittsburgh was routine for Bob. Then came more expeditions: to British Honduras for Carnegie Museum, to Guatemala for Chicago Natural History Museum, and finally in 1935, a place on our staff. More expeditions followed; ranging from our Southwest to the Guianas in South America, on each of which he collected scientific specimens and materials for exhibition.

Then came the war; in 1942 Bob entered the Army and served with the Counter Intelligence Corps in North Africa and Europe. Back in the United States in 1946 with the rank of captain and various medals including the Purple Heart, he was soon in the Museum again.

RESEARCH AND WRITING

There's a saying in museum circles that specimens might as well be left in the jungle as stored, unstudied, in museum drawers. Their value is in the use made of them; it lies in the information that is yielded by them, and published, to be available to all. Back from the war, Bob dug into studying tropical American birds—collections from countries in which he'd made expeditions. His time was occupied with research and

'BIRDS OF MEXICO' BOOK IN MUSEUM SHOP

The Book Shop of the Museum will have copies of "Birds of Mexico" available for purchase by visitors, or on mail order. The book, subtitled "A Guide for Field Identification," is by Emmet Reid Blake, Associate Curator of Birds, with illustrations by Staff Artist Douglas E. Tibbitts. It is published by the University of Chicago Press. The price is $6.

On Saturday, April 18, Curator Blake will be present in the Book Shop to autograph copies purchased by visitors.

writing. During this period he married Margaret Bird. With their two children they now live in Evanston, whence he commutes regularly to the Museum. The Museum has published descriptions of new birds, revisions, and faunal reports from his pen. A pamphlet on how to prepare birds in the field was a Museum need, and Bob supplied that.

Then came the Mexican handbook, a two-and-a-half year task. There's a lot known about Mexican birds; there's the *Catalogue of the Birds of the Americas*, published by our Museum, that occupies about two-and-one-half feet on the book shelf and lists all the kinds of Mexican birds, amongst others, with ranges and the names under which they used to be known; there's the *Birds of Middle and North America*, now measuring about two feet on the bookshelf and still incomplete, put out by the United States National Museum, with descriptions and keys. But this knowledge is inaccessible to all but the specialist with a library and a collection to work with. The many Americans going to Mexico and the continually increasing interest in birds demanded a key to unlock this store of knowledge; to make it available to the many. This is the need that dictated the present volume, *Birds of Mexico*, and this is the volume, I predict, that will meet this need admirably.

Artist of Broad Talents

OUR ARTIST is a versatile man. Douglas E. Tibbitts' splendid illustrations in *Birds of Mexico* represent only one facet of his varied artistic talents and the myriad

DOUGLAS E. TIBBITTS
Illustrator of "Birds of Mexico."

tasks he performs at the Museum. As Staff Artist you may find him one day drawing the tiny teeth of a cretaceous mammal with the aid of a microscope, or the flowering parts of an orchid, a fossil fish, or a ceremonial dance mask, to illustrate a scienfific paper; the next day he may be making a broadly outlined illustration for nature leaflets aimed at school child level, or a poster announcing Museum lectures to the public. He has just finished painting the large-scale landscape background for a sea otter habitat group, and has others for a tapir group and a Nile River marsh-bird group in hand. It might send another man mad, or grizzle him with worry, but Tibbitts stays cheerful.

Born in Reedburg, Wisconsin, in 1919, he went to the University of Wisconsin. At one time he was following his natural history interests into game management, but settled for a straight arts course, majoring in zoology, with some extra art work. He'd always drawn things, and in school his laboratory drawings attracted the attention of his professors for whom he illustrated a general zoology book. A *Fishes of Wisconsin* was planned and he prepared pen-and-ink drawings and water-colors for that.

His college work was interrupted by four war years when he served with the combat engineers in the British Isles, North Africa, and Italy. Returning, he got his B. A. from the University of Wisconsin in 1948, and came to the Museum that autumn.

DEMANDS ARE ALWAYS 'URGENT'

The walls of his office are lined with paintings of birds, fishes, and mammals in various stages of completion, and prominently displayed is a bulletin board with up to a score of requisitions for illustrations, each requested "as soon as possible."

He commutes from nearby Palatine where he lives with his wife, Marion, and their three-year old daughter. He has little time just now for his hobby of photography, but his continued activity in the study of natural history, which earlier produced a published paper on the behavior of the red-winged blackbird, recently resulted in his making the first Chicago record of the pigmy shrew, a specimen he caught in his garage.

Within the broad field of natural history in art, his especial interest is the painting of birds and mammals. It's unfortunate that the Mexican handbook could not have more of his paintings in color, like the frontispiece that is reproduced on the cover of this BULLETIN. But the 329 line-drawings that show what examples of each family are like serve their purpose well, for in that field Tibbitts is a master.

Daily Guide-Lectures

Free guide-lecture tours are offered at 2 P.M. daily except Sundays under the title "Highlights of the Exhibits." These tours are designed to give a general idea of the entire Museum and its scope of activities.

Special tours on subjects within the range of the Museum exhibits are available Mondays through Fridays for parties of ten or more persons. Requests for such service must be made at least one week in advance.

Although there are no tours on Sundays, the Museum is open to visitors as usual from 9 A.M. to 5 P.M.

A Special Exhibit . . .

STEPS IN THE MAKING OF A BOOK SHOWN

By JOHN R. MILLAR
DEPUTY DIRECTOR

THE MAKING OF A BOOK is no small chore. It requires much time and coordinated efforts of many people. Although most of us are deluged with printed matter of all kinds, some of which seems to spring up spontaneously overnight to land in the incinerator the next morning, the nature and sequence of events in the production of printed matter is understood by few.

The publication by the University of Chicago Press of what promises to be a useful and popular book on the birds of Mexico, written by one member of Chicago Natural History Museum's staff and illustrated by another, has been chosen as the occasion for a temporary exhibit that points out the steps involved in making a book of this kind. *This special exhibit will be on view from April 1 to 30 inclusive.*

Book production is divided into three provinces: that of the author, the publisher, and the printer. The author starts the ball rolling with an idea. Authorship entails

BLUE-HOODED EUPHONIA
Male at left, female at right. An illustration by Douglas E. Tibbitts in "Birds of Mexico."

having something worth while to say, the training and skill to say it, and, in the case of non-fiction, the facts to back up what is said. It is here that the Museum enters the field. One of the functions of Chicago Natural History Museum is to acquire and preserve specimens of the animal and plant life of the world, particularly of the New World. Over a period of years, by collecting, by purchase, and by exchange with other institutions and individuals, the Museum's study collection of birds has come to contain all but a very few of the birds known to occur in Mexico. This collection was primary source material for the author of the book under discussion. The Museum also maintains one of the largest and best of the libraries devoted to natural history. Also, by virtue of its standing among scientific institutions here and abroad, the Museum is able to borrow from other collections and libraries both specimens and books

when desired for study purposes. These services are examples of the basic nature of the Museum's contribution to research in the natural sciences.

AN AUTHOR'S OBLIGATIONS

In writing for publication it is the obligation of the author to submit complete copy, including title page, preface, table of contents, list of illustrations, and the illustrations themselves—all in a form suitable

SWALLOW-TAILED KITE

One of the illustrations by Douglas E. Tibbitts in the new book, "Birds of Mexico." The text is by Emmet R. Blake, Associate Curator of Birds.

for publication. The author should be familiar with printing processes and the limitations of machine typesetting. With this knowledge he will understand the need for careful editorial work on his manuscript to correct style, spelling, and punctuation, and to check references and eliminate inconsistencies before the final copy is typed. To postpone this critical scrutiny until galley or page-proof is available greatly increases editorial work by the publisher and costs of printing. Proofreading is done by a qualified employee of the printer to detect errors for which the typesetter is responsible. Reading proof is also done by the author and by the publisher or his editors to detect errors of fact, statement, or construction. The addition of a single comma to a line may require resetting the line. Resetting the line may involve resetting the whole paragraph. If the change is made after the book has reached page-proof stage the makeup of whole chapters may have to be altered. Thus the final costs of printing mount excessively.

The publisher is a merchandiser. He chooses what to print, estimates what the market will be, determines the format of the publication, the size of the edition, advances funds, and hires the printer. He promotes sales and handles distribution. Publishing is a risk-business venture with profit as its normal motive. Material may be published for entertainment, or for propaganda to sway public opinion. Exceptions to these purposes are those instances where the publisher may wish to spend his money for the benefit of mankind, as is the case in the publication of scientific reports by museums and other scientific or educational institutions.

The printer is a manufacturer. He must know how to print material according to specification and be equipped to do so. But aside from hoping that a particular book may be a credit to his craftsmanship and successful, so that further printings may be needed, the printer has no risk and need not have any interest in the matter. Very often the publisher also may be in the printing business but the distinction between the two enterprises remains.

MUSEUM PUBLISHING ACTIVITY

Chicago Natural History Museum is both publisher and printer. As publisher it is interested primarily in contributing to the advancement of knowledge by making the results of research by its staff available to other workers. As printer it is interested in doing a good job economically. Because most of its publications are distributed on exchange to other scientific institutions the world around, there can be no hope of a monetary return. The only compensation is the receipt of scientific reports from other institutions for addition to the Museum's Library and the satisfaction of serving a useful purpose.

The exhibit, in Stanley Field Hall, displays a representation of Museum specimens and the literature on which the writing was based, the author's notes and final manuscript, original drawings by Douglas E. Tibbitts, and steps in the printing process culminating in the finished book. The University of Chicago Press and Photopress, Inc. co-operated in providing much of the material displayed.

A SHOCK FOR ERIN

A tradition was shattered last month on St. Patrick's Day when Dr. Theodor Just, the Museum's Chief Curator of Botany, called attention to the fact that there is no longer any such plant as a shamrock—at least, none recognized under that name by botanists. Various three-leaved plants that have been called shamrocks and used by millions of people each year for "the wearin' o' the green" are now officially designated only by other names. Dr. Just found that in the latest official flora of Great Britain and Ireland, published in 1952 and recently received at the Museum, the name shamrock is no longer applied to any plant—in fact, the word shamrock simply does not appear anywhere in the book. All the plant species of Great Britain and Ireland known to botanists are listed in the book which is the first new official flora of the British Isles to be published in more than twenty-five years. Earlier floras had used the word shamrock as an alternative name for several plants—the most famous contenders for this designation were the wood sorrel and the common white clover (or Dutch clover).

DALLWIG LECTURE TOPIC IS 'LIVING RACES'

"Living Races and Their Way of Life" is the subject of the Sunday afternoon "layman lectures" to be presented by Paul G. Dallwig in April. Mr. Dallwig will be heard at 2 P.M. on April 5, 12, 19, and 26. He will take his audience on an imaginary trip around the world and introduce them, through the medium of the 101 bronzes by Malvina Hoffman in Chauncey Keep Memorial Hall, to the principal living races of mankind.

Members of the Museum may use their membership cards to attend these lectures without advance reservations. All others, with the exception of accredited representatives of the press, must make reservations in advance. Reservations may be made by mail or telephone (WAbash 2-9410). The lectures are free. They start promptly at 2 and end at 4:30 P.M. including a half-hour intermission for relaxation or for tea or coffee in the Museum cafeteria, where smoking is permitted. Admission is restricted to adults.

The April lectures are the last of the current season, but Mr. Dallwig will return with a new series late in the autumn.

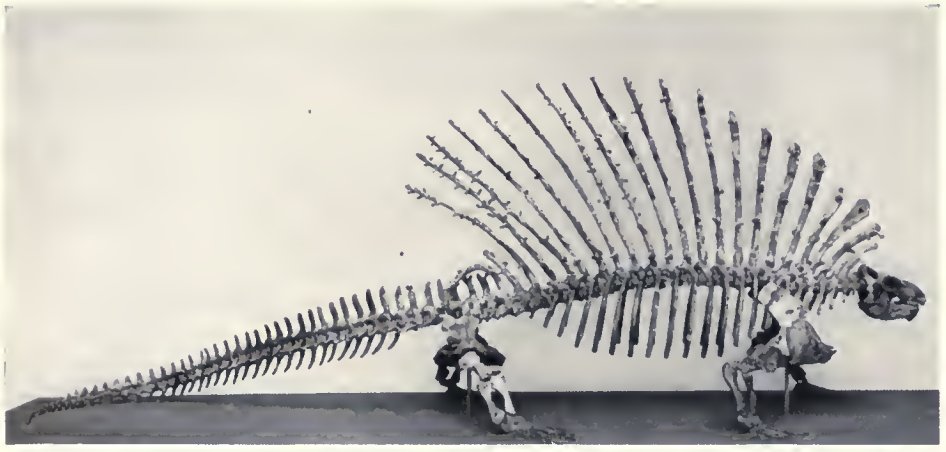
Illinois Audubon Lecture On Sunday, April 12

The last of the "screen-tours" in the current season of the Illinois Audubon Society will be presented in the James Simpson Theatre of the Museum on Sunday afternoon, April 12, at 2:30. "From Coast to Coast" is the title, and Alexander Sprunt, Jr., of Charleston, South Carolina, will be the lecturer. He will show color films of the life of birds in all parts of the country made by some of the foremost natural science photographers. The public is invited, and admission is free. Members of the Illinois Audubon Society and of the Museum may have seats in the reserved section of the theatre upon presentation of their membership cards to the ushers, but reserved seats must be claimed not later than 2:25 P.M.

EXHIBIT SHOWS PERMIAN REPTILES RELATED TO MAMMALS

By RAINER ZANGERL
CURATOR OF FOSSIL REPTILES

THE general evolutionary history of the furry animals, the mammals, is fairly well known far into the distant past. Two large groups of reptiles, the pelycosaurs and the therapsids, are related to the mammals. So close is the skeletal resemblance of some therapsid reptiles to the mammals that they are often called mammal-like reptiles. The therapsids in turn are descendants of the pelycosaurs; the most advanced members of this group merge almost indistinguishably with the primitive therapsids. The history of mammalian evolution is essentially known over a period of some 250 million years.



SKELETON OF REPTILE THAT LIVED 230 MILLION YEARS AGO

Edaphosaurus pogonias from the Early Permian of Texas. A specimen presented to the Museum by the University of Chicago, remounted in the paleontological laboratories here and recently placed on exhibition among the fossil collections in Ernest R. Graham Hall (Hall 38).

Representative skeletons of a number of pelycosaurs have been placed on exhibition in three new cases in Ernest R. Graham Hall (Hall 38). A fourth new case contains a large herbivorous therapsid.

Pelycosaurs flourished near the end of the Paleozoic Era, about 230 million years ago. At that time they deployed into three major lines of development. A member of the most primitive line, *Ophiacodon*, is included in the central group of four skeletons. This was a rather large, semi-aquatic reptile that retained many of the primitive features of the pelycosaurs. The two more advanced lines are adaptively distinct: one, the Edaphosauria, consisting of herbivores, and the other, Sphenacodontia, of carnivores.

The edaphosaurs are represented in the central case by *Casea*, a relatively small reptile with a barrel-shaped body. The culmination of one line in this group, *Edaphosaurus*, is mounted in one of the two side cases. This reptile was about eight feet long and characterized by spectacularly elongated vertebral spines. The spines are set with lateral nodes that give an impression of cross-bars. A number of doubtful theories have been suggested to explain the function of these long spines. It is safe to state that the bony spines were covered and connected by skin. Thus *Edaphosaurus* (and *Dimetrodon*, see below) had a much greater body surface than an animal of equal size lacking a dorsal fin. Since living reptiles control their body temperatures largely by moving into or out of the heat of the sun, it has, quite recently, been suggested that the dorsal fin might have served as an additional mechanism of temperature control. Valid objections can be raised against all of the proposed theories, however, and the bizarre structure may have had no function whatever.

The carnivores, Sphenacodontia, are represented by two skeletons in the central case, the delicately built *Varanops*, a primitive flesheater, and *Sphenacodon*, an advanced form with moderately elongated vertebral spines. The most striking member of this line is *Dimetrodon*, a reptile that measures in excess of ten feet in length. Like *Edaphosaurus*, it possesses very long vertebral spines that formed a vertical finlike structure on its back. No cross-bars are developed. It was from the Sphenacodonts that the more advanced mammal-like reptiles took origin.

All of the pelycosaurs displayed were taken from beds of Early Permian age, about 230 million years ago, and all but *Sphenacodon*, which came from New Mexico, were found in beds of deltaic origin in north-central Texas. The skeleton in the fourth case, *Aulacocephalodon*, belongs to a large, clumsy, vegetarian therapsid. Although this animal belongs to the mammal-like reptiles, it represents a sideline that became greatly modified for feeding on plant material. Adult specimens, such as the individual on display, are entirely devoid of teeth. *Aulococephalodon* lived nearly 200 million years ago on swampy plains of Southern Africa and was preserved in the deposits of the Karroo Desert.

The skeletons were obtained as a gift from the collections of Walker Museum of the University of Chicago. All have been remounted.

HOW A PELYCOSAUR LOOKED IN LIFE

Restoration of Edaphosaurus, the most bizarre reptile known from Texas. It lived about 230 million years ago. Miss Maidi Wiebe of Department of Geology staff is the artist. A skeleton is exhibited in Hall 38.

It is not the facts which guide the conduct of men, but their opinions about facts; which may be entirely wrong. We can only make them right by discussion.

—*Sir Norman Angell*

LECTURES FOR ADULTS ON APRIL SATURDAYS

Four more Saturday afternoon lectures on science and exploration remain to be given in the James Simpson Theatre during April. They will complete the annual Spring Course, provided by the Edward E. Ayer Lecture Foundation Fund. Lectures begin at 2:30 P.M. All are illustrated with motion pictures in color. Limited accommodations make it necessary to restrict admission to adults. Special free motion-picture programs will be given for children on the mornings of the same Saturdays under the auspices of the James Nelson and Anna Louise Raymond Foundation.

Following is the schedule of lectures for adults:

April 4—TIP-O-THE-MITTEN
Olin Sewall Pettingill, Jr.

April 11—IRAN
Kenneth Richter

April 18—ADVENTURE IN BORORO LAND
Sasha Siemel

April 25—LAND OF THE ANCIENT MAYA
Arthur C. Twomey

No tickets are necessary for admission to these lectures. A section of the Theatre is allocated to Members of the Museum, each of whom is entitled to two reserved seats. Requests for these seats should be made in advance by telephone (WAbash 2-9410) or in writing, and seats will be held in the Member's name until 2:25 o'clock on the lecture day.

STAFF NOTES

Bryan Patterson, Curator of Fossil Mammals, who has been engaged for more than a year in Argentina on fossil vertebrate research, is scheduled to return to his post at the Museum the first week in April. Mr. Patterson's mission was made possible by the award to him of a Guggenheim fellowship .... **George I. Quimby,** Curator of Exhibits in the Department of Anthropology, spent several days in the University of Michigan's Carbon-14 Laboratories at Ann Arbor last month, to observe work on dating anthropological material by the Carbon-14 method .... **Mrs. Nancy Peters,** formerly of the First National Bank of Chicago, has been appointed Assistant Librarian. A vacancy on the Library staff had been occasioned by the recent resignation of **Mrs. Louise Boynton Denison,** Administrative Assistant .... **Miss Harriet Smith,** a lecturer on the Raymond Foundation staff, was the featured guest interviewee on the Beulah Karney Show over radio station WENR March 2. She told of the educational work conducted for children by the Museum .... The story of the shamrock was told on St. Patrick's Day by **Miss Christine Tardy,** Associate Public Relations Counsel, and George Thompson of the staff of the Municipal Museum in Belfast, Ireland, over television station WGN-TV. Mr. Thompson is currently working at Chicago Natural History Museum on a Fulbright grant .... **Dr. Theodor Just,** Chief Curator of Botany, has been appointed a member of the committee on guidance of the Botanical Society of America .... **Henry S. Dybas,** Associate Curator of Insects, **Charles H. Seevers,** Research Associate in Insects, and **Eugene S. Richardson, Jr.** Curator of Fossil Invertebrates, last month attended meetings in St. Louis of the Midwest Section of the American Entomological Society. Mr. Seevers and Mr. Richardson presented technical papers.

GIFTS TO THE MUSEUM

Following is a list of the principal gifts received during the past month:

Department of Anthropology:

From: Robert D. Jones, Jr., Coal Bay, Alaska—Aleut type skull (female), Cherni Island, Aleutians; Robert Trier, Chicago—archaeological and ethnological specimens, Easter Island

Department of Botany:

From: University of California, Berkeley—15 phanerogams, Andean region of Peru; Instituto Agronomica de Norte, Belem, Brazil—40 phanerogams, Brazil; Instituto de Biologia, Mexico City—17 phanerogams, Mexico; Dr. Earl E. Sherff, Chicago—253 phanerogams, Hawaii; United States National Museum, Washington—240 compositae, Colombia

Department of Geology:

From: Dr. Emilio Iacarelli, Italy—cinnabar specimen, Italy; E. E. Schneider, Chicago—quartz rock and crystals, Texas; Jon Whitfield, Evanston, Ill.—part and counter-part of elytron of cockroach, Illinois

Department of Zoology:

From: Harry L. Cook, Chicago—8 fishes, Brazil; Luis de la Torre, Highland Park—24 mammals, Guatemala; Robert J. Drake, Tucson, Ariz.—5 land shells, Mexico; Henry Hildebrand, Port Aransas, Tex.—preserved fish (*Corvula sanctaeluciae*), Gulf of Mexico; Harry Hoogstraal, Cairo, Egypt—432 mammals, 14 birdskins, 60 frogs, 115 lizards, 14 snakes, Egypt; Robert W. Pennak, Boulder, Colo.—small collection of non-marine shells, New Mexico; Burk Smith, Oak Park, Ill.—9 wasps, United States; Dr. John G. Williams, Kenya Colony, East Africa—2 birdskins, Atlantic Ocean; Dr. Marshall Laird, Lauthala Bay, Fiji—11 lizards, Fiji Islands; Dr. Russell E. Mumford, Cortland, Ind.—12 bats, Indiana; Museo de Historia Natural de la Salle, Bogotá, Colombia—14 snakes, Colombia; Paul Pazzaglia, Chicago— domestic cat skeleton, Chicago

PROGRAMS FOR CHILDREN CONTINUE THIS MONTH

Four more free motion-picture programs for children will be presented at the Museum on Saturday mornings during April. On two of the programs, explorers who made the films will tell their stories for the children.

The children's programs, under the auspices of the James Nelson and Anna Louise Raymond Foundation, will be given at 10:30 A.M. in the James Simpson Theatre. Children may come alone, accompanied by parents or other adults, or in groups from schools, clubs, and other centers. No tickets are needed. Following are the titles and dates of the programs:

April 4—WILD LIFE IN ACTION
Story by Olin Sewall Pettingill, Jr.

April 11—ALASKAN ESKIMOS

April 18—ADVENTURE IN BORORO LAND
Story by Sasha Siemel

April 25—OLYMPIC ELK

NEW MEMBERS

The following persons became Museum Members from February 12 to March 13:

Associate Members

B. T. Brennan, Stephen Drago, Miss Elizabeth J. Hurlbut, William Laing, Herbert J. Watt

Annual Members

Dr. C. E. Allen, Osborn Andreas, Zenas H. Beers, Harold L. Bredberg, Max E. Bronner, Robert Cain, Charles S. Craigmile, Mrs. Mary Crown, Harry L. Fellowes, Miss Alice H. Gallagher, Mrs. James A. Griffin, Jr., Edwin A. Hale, T. B. Hale, Frank D. Huth, C. W. Kuhnen, Albert H. Levy, Chapin Litten, Dr. Charles Milton Mann, Earle A. Mann, Paul E. Mathias, Mrs. William W. Miller, A. E. Montgomery, Ernest Oechslin, Jr., Dr. Frank B. Papiorniak, Dr. George L. Perkins, B. H. Putnam, A. Jerry Putterman, Homer R. Rizner, Charles L. Smith, Edward R. Smith, Howard W. Stange, George Tonn, Benjamin D. Waldie, Donald A. Weidler, Arthur Wlochall

TV Programs Postponed

Due to circumstances beyond the control of the Museum, the scheduled appearances of members of the scientific staff on a television program called "This Wonderful World," announced in previous issues of the BULLETIN, have been indefinitely postponed. This was one of a number of program changes made by American Broadcasting Company-Paramount Theaters, Inc., following the recent network mergers.

Animals not in zoos may be seen at Chicago Natural History Museum.

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BULLETIN

Vol. 24, No. 5 - May - 1953

Chicago Natural History Museum

Sea Otter

(Turn to page 3)

Chicago Natural History Museum

FOUNDED BY MARSHALL FIELD, 1893

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Members are requested to inform the Museum promptly of changes of address.

Special Exhibit During May . . .

NATURE-ART BY CHILDREN AND OLDER STUDENTS

BY MARGARET G. BRADBURY
ARTIST, DEPARTMENT OF ZOOLOGY

Parts of some exhibits will appear in duplicate at the Museum during May when students from the School of the Art Institute of Chicago have their annual special exhibition in Stanley Field Hall of Chicago Natural History Museum. The students will display drawings created around natural history subjects they have studied during classes held at this Museum under a cooperative arrangement of many years' standing with the Art Institute. The exhibition will be on view from May 1 to 31.

The participants are children of the Junior School and adults in elementary classes of the Day School, whose work has been selected by their instructors as the best of the year's accomplishments. From the group of drawings thus assembled, two members of this Museum's staff—Gustaf Dalstrom, Artist in the Department of Anthropology, and the writer—selected the group to be placed in the final exhibit. Arrangements for the judging were made through Mrs. C. S. Howlett, head of the Art Education Department of the Art Institute.

The drawings are all rendered in pastel chalk, a medium particularly flexible and suited to the experimental tendencies of the young or beginning artist. The result, however, is a broad span of effects in texture, color, design, and form, and provides a most interesting juxtaposition of the achievements of children with those of adults.

YOUNGSTERS STRESS COLOR CONTRAST

There is, in fact, a difference in the way classes for the two groups are conducted. Children, their instructors find, are highly imaginative about their work and may, for example, employ striking color contrasts in otherwise realistic attempts. Teachers encourage students to overcome problems of co-ordination and visualization, finding that some are already apt at discerning design elements. Among their chief tasks is that of presenting material that will stimulate ideas in a child, leaving the execution of the piece pretty well up to the child. Highly desirable materials are found all through Museum halls. Animal habitat groups rank as high favorites, and this portion of the classwork is presented with considerable enthusiasm. One youngster liked all the animals because, unlike those in a zoo, they stand still, whereas a second, who prefers birds, finds them easier to draw than people "because they have more interesting faces." Whatever the artists' favorites may be, viewers will find manifested in the drawings qualities of sincerity, warmth and humor as well as excellence in form, color and design. Teachers for this group are: Mrs. Dorothy F. Bender, Mrs. Marion Lukens, Mrs. Adelheid Hirsch, Mrs. Velma Miller, and Gerard Monti.

EXPERIMENTS IN DESIGN

The students of Miss Ethel Spears (teacher of the adult class in the general drawing basic course whose work appears in this exhibition) also make admirable use of the subject matter in the Museum galleries in their studies of composition and design principles. The interests of this group frequently extend beyond the animal groups to a use of other exhibits, among them the skeleton mounts. An artist in realism will prepare a drawing of an animal after first having examined and sketched its skeleton, giving greater assurance of accuracy in proportions. A student experimenting down more abstract avenues will incorporate isolated bone shapes into his design. Another area attractive to this group comprises the exhibits of primitive art of South Sea peoples, among whose extraordinary designs these modern artists find splendid study material.

It is always a pleasure to find the Museum instrumental in educative processes, which is truly one of its functions. The tendency has been to focus attention on students of natural history, but more than it ever suspected the Museum has been a storehouse to delight the very soul of the student of fine art, as revealed in the designs and illustrations of this special exhibition.

THIS MONTH'S COVER

Our cover shows the habitat group of sea otter recently installed in the Hall of Marine Mammals (Hall N) on the ground floor of the Museum. Material for the group was collected by the Aleutian Zoological Expedition, 1952, with the co-operation of the United States Fish and Wildlife Service on Amchitka Island (see story on page 3).

EXPEDITION TO STUDY BIRDS IN MEXICO

An ornithological expedition to conduct extensive field work in many areas of Mexico got under way at the end of April with the departure of Emmet R. Blake, Associate Curator of Birds. Mr. Blake will spend about three months in the country, and will probably visit most of the Mexican states except Yucatan, surveying the bird life, and incidentally collecting some mammals and reptiles as well.

HONORED AT BOOK LUNCHEON

Mr. Blake and Douglas E. Tibbitts, Staff Artist of the Museum, were honored at a luncheon given by the University of Chicago Press on March 26. The occasion marked the then forthcoming publication (April 10) by the university press of *Birds of Mexico, A Guide for Field Identification*, of which Mr. Blake is author and Mr. Tibbitts is illustrator. Dr. Morton Groezins, head of the university press, was host. Present were Frederic Babcock and Alfred Ames, editor and reviewer respectively of the *Chicago Tribune*'s Magazine of Books; Van Allen Bradley, book editor of the *Chicago Daily News;* Colonel Clifford C. Gregg, Director of Chicago Natural History Museum; and Rollin D. Hemens and Robert L. Mittenbuhler of the university press staff.

Daily Guide-Lectures

Free afternoon guide-lecture tours are offered daily except Sundays under the title "Highlights of the Exhibits." These tours are designed to give a general idea of the entire Museum and its scope of activities. They begin at 2 P.M. on Monday through Friday and at 2:30 P.M. on Saturday.

Special tours on subjects within the range of the Museum exhibits are available at other hours, morning or afternoon, Mondays through Fridays, for parties of ten or more persons. Requests for such service must be made at least one week in advance.

Although there are no tours on Sundays, the Museum is open to visitors as usual from 9 A.M. to 6 P.M.

RARE SEA OTTERS OF ALEUTIANS IN NEW HABITAT GROUP

By COLIN CAMPBELL SANBORN
CURATOR OF MAMMALS

IT WAS THE QUEST for beaver that led to the first exploration of many parts of the western United States and Canada. More valuable fur-bearing mammals, the sea otter and the fur seal, played a large part in the exploration and colonization of the bleak and stormy Aleutian Islands and the coast of Alaska. A new habitat group of the extremely interesting sea otter was recently installed in the Hall of Marine Mammals (Hall N) on the ground floor of the Museum.

SEA OTTERS--A NEW HABITAT GROUP IN HALL N

Because their fur was so highly valued, these rare creatures from the Aleutians had narrow escapes from total extinction by ruthless hunters, undee both the Russian and Ameeican regimes in the islands.

The Aleutian region was discovered in 1741 by Vitius Bering, a Dane, and Alexei Chirikof, a Russian, commanding two ships on a government-sponsored Russian exploring expedition. Accompanying the expedition was the naturalist George Wilhelm Steller who published the first accounts of the natural history of the area. Among other things, they brought back about nine hundred sea-otter skins. These attracted so much attention that years of sea otter and fur seal hunting for the Russian market resulted.

The natives of the region, the Aleuts, were pressed into service and sent out to sea in their frail skin-boats to hunt otter. Many of the Aleuts were lost on these hunts. The people were exploited in other ways also, and the population dropped rapidly.

One mammal of the region, Steller's sea cow, which was large and slow-moving, was soon exterminated because it was killed for meat. The fur of the sea otter was so greatly valued that the trade in its skins grew to enormous proportions. An estimated fifty thousand were killed in 1786. The slaughter could not go on forever and, as furs became scarcer, the Russians put certain conservation measures into effect to try to save the remaining animals.

PROTECTIONS REINSTITUTED

In 1867 the United States purchased Alaska and all restrictions on hunting were removed; so the ruthless hunt for fur began again. This continued until 1910 when both the fur seal and the sea otter came under government protection. The fur seal has once more become well established and the sea-otter population is increasing slowly but satisfactorily. The former range of the sea otter extended from southern California to Alaska. Today there is one small "pod" (the term for colonies of this animal) in southern California and numerous others on the southern Alaska coast and on some of the Aleutian Islands.

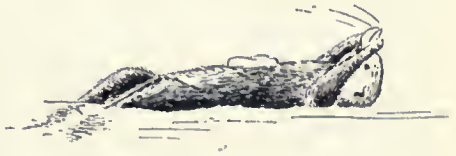
The sea otter is a typical marine mammal, more at home in the water than on land. The hind feet, with which it swims, have become flippers, but its front feet still resemble those of a land mammal. It sleeps on shore and comes ashore two or three times a day. The rest of its time is spent in the water hunting, feeding, and playing.

The sea otter's main article of food is sea urchins. Other favorite items are mollusks, crabs, and a few fish. It sometimes dives to great depths to get its food and is often seen a mile or more off shore. The food is eaten while the otter lies on its back, its chest and abdomen serving as a table. Some of the hard-shelled mollusks are broken open by hammering them on a rock, brought from the bottom for this purpose. The rock rests on the otter's chest and the mollusk is held in both forepaws and brought down against the rock. The ability to balance food on the abdomen, even in rough weather, is remarkable. The southern sea otter of the California coast feeds extensively on abalones.

AGILE IN WATER

When in the water, and not feeding, the otter is usually on its back. It cleans and scratches itself, often bringing its flippers forward for inspection or grooming. It can turn a somersault in the water from this position and often rotates itself lengthwise in the water, turning over and over. Mating takes place in the water. There seems to be no particular mating season, but mating has been observed more often in spring than at any other time of year. There is only one pup produced and it is born ashore in a sheltered place among the rocks.

Full-grown otters are about four feet in length and weigh around seventy-five pounds. The color varies from a black to a dark brown and some old ones have a silvery gray face, head, and neck. The fur is quite oily, so that it does not absorb water. The voice is high and sharp and, at a distance, sounds like a whistle. The killer whale is the only active enemy of the otter.



'TABLE MANNERS' OF SEA OTTER

The animal's eating habits are curious and amusing. It lies on its back in the water and places a rock on its chest. Holding a mollusk in both forepaws, as Artist Margaret G. Bradbury's drawing indicates, the otter cracks the shell against the rock. It then extracts the meat and uses its chest and abdomen as a table for its meal, undisturbed by rough seas.

GROUP FROM AMCHITKA

The material for the new group in the Museum was collected on Amchitka Island by the Aleutian Zoological Expedition in 1952, conducted by the writer, with the

(*Continued on page 8, column 1*)

WEST INDIES EXPEDITION SAILS ON SCHOONER

The Museum's West Indies Zoological Expedition began operations in the last week of March with the sailing of Donald Erdman from Puntarenas, Costa Rica, aboard his 37-foot auxiliary schooner, the *Booby*. Mr. Erdman, an ichthyologist formerly on the staff of the United States National Museum, Washington, D. C., is conducting this expedition under a special arrangement with Chicago Natural History Museum. Cruising the Caribbean until some time in August, Mr. Erdman and his shipmates will collect fishes in the waters along the coasts of various Central American countries and islands of the West Indies. His first port was to be Balboa, Panama. Mr. Erdman, who is now a resident of Costa Rica, acts as his own sailing skipper.

A 'BUSMAN'S HOLIDAY' IN SOUTH AMERICA

By BRYAN PATTERSON
CURATOR OF FOSSIL MAMMALS

WHEN a Museum scientist leaves for an extended stay on another continent, those who happen to read about his departure usually visualize him as spending his time in a tropical rain forest, in a desolate, arid region, or in comparable exotic surroundings. Usually he does, but not always. In my own case, I have just returned from a fourteen-month stay in Argentina, all but three weeks of which was devoted to intensive work on fossil mammals contained in museums—exactly the sort of work that I do in Chicago.

The explanation of this does not lie in any aversion on my part to field work—quite the contrary—but in the fact that in regard to the particular problems on which I was engaged the field work had already been done. Thanks to the support of Marshall Field, now First Vice-President of the Museum, the institution conducted a series of paleontological expeditions to Argentina and Bolivia from 1922 to 1927 under the leadership of Elmer S. Riggs, formerly Curator of Paleontology, These expeditions brought back to Chicago a magnificent representation of the fossil mammalian faunas of southern South America that range in age from Eocene to Pleistocene. I joined the Museum staff too late to participate in the fun of collecting the material, but I fell heir to the numerous research problems involved.

HOME WORK IS HARDEST

The year 1927 in which the expeditions closed is a long time ago, measured in terms of a human lifetime, and it may well be asked, "Why the long delay?" The collecting of specimens, although it may involve travel to far corners of the earth, strenuous work, difficulties and even hardships in the field, is actually the simplest part of museum research work. The more difficult part begins after the collections have reached the museum. First, the specimens have to be put in condition for study, a task that of course varies with the nature of the materials. For fossil vertebrates, this is very laborious and time-consuming. The bones, often fragile and delicate, have to be freed from the surrounding matrix, which is often very hard, and months may be spent on the preparation of a single specimen.

In the case of the collections brought together by the Marshall Field Expeditions, some ten years elapsed before all of the material was prepared for study. With the specimens available, the next step is to determine the species represented. Only after this has been done can the contribution to knowledge represented by collections be accurately assessed and the preparation of detailed reports undertaken. Determination of material may range from a rather simple to a very difficult task. The degree depends directly upon the state of previously published work and the accessibility of adequately determined earlier collections that are pertinent to the new collection under study. If the literature is inadequate and earlier collections are very widely scattered and in large part not properly determined, the difficulties can be enormous. This was the situation confronting anyone who attempted to determine the material obtained by the Marshall Field Expeditions.

A UNIQUE FOSSIL FAUNA

Major collections of South American fossil mammals are contained in more than a dozen institutions in three continents—South America, North America and Europe. The type specimens, that is those on which the descriptions of the species were originally based, are mostly in Argentina. Most of the material contained in North American and European museums has never been compared with these types, and it is not possible to identify specimens with any assurance from the descriptions given in the literature. This is due to special and interesting circumstances. Our knowledge of South American fossil mammals and of the chronology of Cenozoic continental deposits is in very large measure due to two remarkable Argentines, the brothers Florentino and Carlos Ameghino. Between them they brought to light what was in effect a new world of life, the mammals of Tertiary South America, which are completely unlike any occurring elsewhere in the world.

The greater part of the work the Ameghinos accomplished over half a century ago was carried on without any official support. Florentino operated a small stationery store, and on the slender profits from this supported himself and financed Carlos in a long series of collecting expeditions in Patagonia, then among the least-known regions of the world. Patagonia is one of the world's great fossil fields and the Ameghinos were the first to explore it. The new and fascinating specimens discovered in a constant stream by Carlos were rapidly described by Florentino, who, working early and late, could barely manage to keep abreast of the flood. The preparation of detailed, properly illustrated monographs was obviously impossible under such conditions, and the legacy left to posterity by Florentino, who died at the relatively early age of 56, consists in large part of a long series of papers containing brief, unillustrated diagnoses of new forms. Without access to the specimens on which they were based, the great majority of these diagnoses cannot be utilized for purposes of identification, nor can the validity of the numerous species proposed be determined. The Ameghino Collection was, of course, private property. After Florentino's death, it was boxed up to remain relatively inaccessible until the early 1930's, when it was purchased by the Argentine government and placed in the Museo Argentino de Ciencias Naturales. Due to these various difficulties, few of the collections of South American fossil mammals contained in North American and European museums are adequately determined.

TWO FOUNDATIONS GIVE AID

In 1938, thanks to the grant of a Carnegie Corporation grant-in-aid for travel from the American Association of Museums, I was able to visit France and England and to examine South American fossils in Paris and London. This solved certain problems, but on the other hand made it even more evident that only an examination of the Ameghino Collection would suffice for complete identification of the Marshall Field collections. I had hoped to do this in the early 1940's, but the war years and other work that had come up in the meantime intervened. In 1951, however, through the award of a John Simon Guggenheim Memorial Foundation Fellowship, it was at last possible to make the long deferred journey to South America and to examine the Ameghino and other collections contained in the excellent museums of Argentina. Every possible facility for work was afforded me while there, and amid such pleasant surroundings and with so much of interest to examine, the months passed by like weeks. Nearly every question that had been insoluble at long range proved capable of solution with the original types at hand. It is now possible, twenty-five years after they were collected, to begin the final phase of work on our South American fossil mammals.

Visiting Hours Change May 1

Beginning May 1, summer visiting hours, 9 A.M. to 6 P.M., will go into effect, continuing until September 7 (Labor Day).

THE BIRTH AND DEATH OF PARICUTIN VOLCANO IN MEXICO

By SHARAT K. ROY*
CHIEF CURATOR, DEPARTMENT OF GEOLOGY

"ONE that with a flash begins ends in smoke"—that is the life story of *El Monstruo*, the Tarascan Indian name for the volcano Parícutin. As volcanoes go, Parícutin died a premature death, but while it lived, it put on one of the greatest shows on earth. Bypassing infancy, it reached adolescence in a matter of hours. Its fiery bosom outswelled a maiden's prayer and rose to a height of 150 feet in less than a week. On the first anniversary of its birth, the cone attained an altitude of better than 1,000 feet and assumed a perfect geometric shape—one that Euclid might well have envied. From the vents of the cone, red-hot lava poured out at an average rate of 2,700 tons per minute and crept forward fanwise like a crevassed glacier aflame, leaving death and desolation in its wake. The temperature of the lava a mile from its vent registered 1994° Fahrenheit.

Every six seconds, occasionally at longer intervals, either in the dark of night or in the light of day, amidst billowy clouds of steam, gas, and dust, fountains of fire lit the sky; terrific blasts shook the peaceful countryside; dust columns borne aloft by the uprushing gases behaved like a thunder cloud; lightning and thunder added their din to the clatter of the blazing inferno; flaming arcs leaped out of the crater and bursting gas bubbles sent out fiery umbrellas; cherry-red chunks of lava, cinders, and ashes hurtled 3,000 to 4,000 feet into the air and fell crashing down the cone, gleaming incandescently. It was the most awe-inspiring display of nature's fireworks the land of the Aztecs has ever witnessed. Vesuvius in its heyday had nothing more spectacular to show. Stunned spectators stood motionless, even burst into cheers, unmindful of the fact that they were cheering a volcano.

VOLCANO IN ACTION

How Parícutin looked in the early days following its sudden eruption in a cornfield in 1943.

NOW ASLEEP OR DEAD?

Is Parícutin now dead? Except for a wisp of steam and gas spouting around the crater, it shows no other sign of life today. Perhaps, like its extinguished neighbors, it has gone to a sleep from which there is no awakening. Yet, it is impossible to predict the life-span of a volcano. Krakatoa, near Java, became disastrously active after a repose of two centuries, destroyed scores of towns and villages, and snuffed out the lives of 36,000 people. Vesuvius had been dormant so long that it was overgrown with thick vegetation, but in 1631 it became violently active and has been intermittently active ever since.

The name "volcano" comes from Vulcan, the Roman god of fire. The traditional concept of a volcano is that it is a cone-like hill or mountain with a crater at its summit, whence at times are ejected rocks, cinders, ashes, and lava. Actually, a volcano is a vent from which hot or molten material is ejected from the depths of the earth. The essential feature of a volcano is the conduit or volcanic pipe that connects the magma chambers of the interior with the exterior of the earth. This does not mean that the interior of the earth is molten. Seismic records (earthquake records registered on a seismograph) indicate that the outer shell of the earth behaves like a solid for about

PARICUTIN CRATER AS IT IS TODAY

An aerial view of the famous Mexican volcano, now dormant. The crater has two throats with a long ridge between them. Until recent months it was belching forth smoke, sparks, and thousands of tons of lava that ravished the countryside for miles around. In the volcano's present inactive state, it was possible for Chief Curator Sharat K. Roy to reach the rim after an arduous climb. Photograph is by courtesy of Dr. Carl Fries.

Dr. Sharat K. Roy, Chief Curator of Geology, returned in April from a two-month journey in Mexico during which he studied the now dormant Parícutin volcano and collected volcanic rocks. He also visited silver and other mines and collected specimens of ores and minerals.

1,800 miles. But there are magma chambers or reservoirs of molten rocks underlying certain regions known as volcanic belts or belts of fire. There are two such belts and Parícutin lies in one of them—the one that encircles the Pacific Ocean and extends along the Andes, Central America, Mexico, the United States, Canada, Alaska, the Aleutian chain, Kamchatka, Japan, the Philippines, and Java.

NEW VOLCANOES PROBABLE

The volcanic belts are lines of weakness characterized by fracturing, faulting, and folding in the earth's crust. They thus are favorable sites for volcanic activities. Volcanic forces, however, could be sufficiently powerful to make their own outlets and volcanoes may originate where no connection between them and a fracture line appears to exist. Such is the case in the Highwood Mountains in the great plain of central Montana where no evidence of a line of weakness could be determined. As a rule, though, new volcanoes break out only in volcanic areas. That there will be new volcanoes at the site of Parícutin is almost a certainty. Judging from the numerous extinct volcanoes surrounding Parícutin it can be safely assumed that underlying the region there is a magma chamber restlessly awaiting to break through.

The immense weight of the crust exerts a tremendous pressure on the gases dissolved in the magma. They are forever seeking an escape outlet. The chief magmatic gas is steam. The combustible gases are hydrogen, hydrocarbons, and various compounds of sulphur. The combustion of these gases, especially that of the hydrogen, produces the only true flames seen at an eruption. Other "flames" are merely incandescent lava fragments shot into the air. Parícutin never did emit sulphurous gases; chlorides, ammonium chloride in particular, formed abundantly. The gases, especially the super-heated steam, play the most dominant and active role in volcanic eruptions. It is these gases that cause the explosive puffs and send solid rocks, cinders, ashes, dust, and bombs flying from the crater. A volcano builds its cone from these fallen fiery objects, not from lava flowing out of the crater. The only lava that helps in the building up of a cone is that which is blown out. Ejected lava clots, exposed to the air, harden and fall, assuming various forms, usually with spirally twisted ends (bombs, lapilli, etc.). Exploded lava in the crater forms dust and ashes. Cinders are ejected lava-fragments from which gases have escaped. Volcanic dust, because of its light weight is carried away hundreds of miles by the prevailing winds. The dust from Parícutin is known to have drifted to Mexico City, a distance of 200 miles.

Where, then, did the lava that engulfed two villages—Parícutin and Parangaricutiro—and spread over acres and acres of fertile land issue from? From vents in Parícutin's sides, not from the crater. Will this stupendous outpouring create an empty tunnel within the earth from which it came? So far as is known, it will not. Magma reservoirs are constantly making readjustments of their lost contents. There might be some subsidence of the overlying area, but it would be hardly noticeable.

Lava is the name applied for magma (molten rock) issuing at the earth's surface. Both the liquid material and the rock formed from magma are called lava. Different types of volcanoes discharge different kinds of lavas. Even one and the same volcano may erupt a variety of lavas. In the main, however, there are two kinds of lavas that volcanoes eject—silicic or rhyolitic, and basic or basaltic. The silicic kind may contain as much as 75 per cent of silica; the basic about 50 per cent of the bulk composition. The lava of the former is viscous, even at a very high temperature (2000° Centigrade), and its contained gases escape with difficulty, giving rise to explosive eruptions; that of the latter is much more fluid and remains so down to much lower temperature (800° Centigrade). The gas thus escapes much more rapidly without explosive violence. There are, however, exceptions to this general rule. Parícutin is a point in the case. The lava of Parícutin is basaltic or basaltic-andesite. According to the general rule its lava should be fluid and it should be less explosive than it had been. The explanation for the exception is that even the much more fluid basaltic magma may become viscous by standing in the conduit and behave as viscous acidic lava, both in the manner of its flow and its explosive character.

A PEACEFUL VILLAGE BEFORE THE LAVA FLOWED

The tiny community of Parangaricutiro, which was wiped out and buried, as was also its sister village of Parícutin from which the volcano receives its name.

EXCEPT FOR A STEEPLE TOP, VILLAGE HAS VANISHED

The flow of lava has completely engulfed the little settlement of Parangaricutiro. All of the inhabitants were forced to evacuate. No trace of their homes remains.

Parícutin was born in a cornfield on February 20, 1943. Dionisio Pulido, a Tarascan Indian from the nearby village, Parícutin, state of Michoacan, Mexico, and his boy were the only eye-witnesses of the momentous occasion. The elder Dionisio was plowing for corn when he heard a low rumble and saw a spiral of smoke (steam) behind his furrow. The initial explosions shook the fertile fields and ejected fragmental materials, clouds of dust, gas, and ashes. From these ejected projectiles Parícutin built a 1,500-foot-high cone. At the beginning, the cone gained height rapidly, but as its base broadened more and more material was needed and altitude was gained slowly.

FIERY LAVA TERRIFIES

Lava first issued from the vents at the base of the cone as an incandescent viscous liquid, but, as it advanced, it became coated with a crust that broke off at cascades exposing a molten glowing interior. The moving of the tumbling, jostling mass of fiery lava is a fearful sight. The individual flows were from 12 to 20 feet thick, but the total thickness of all the superposed flows adjacent to the volcano ranged from 300 to 450 feet. In the nine years of Parícutin's activities it has discharged nearly 700 million

cubic feet of lava encompassing some 16 square miles.

The lava was not alone destructive—the ash killed most of the trees, particularly the resinous pines, within a radius of several miles from the volcano. This ended the tapping for turpentine and livelihood for hundreds of people who have seldom enjoyed three square meals a day. With the destruction of vegetation, the animal life disappeared also. Birds that fed on seeds took to wings for happier grounds; small animals —deer and rabbits—migrated to fertile fields and with them, for obvious reasons, went the coyotes.

Good sometimes comes of evil. So will it come for the thousands living by the simple faith of Indians. Volcanic ash, on decomposition, makes good soil. Dionisio may not plough the lava fields of Parícutin for corn again, but the Dionisios to come may, and perhaps they will reap a far richer harvest than ever before.

Uruapan, the nearest town to Parícutin, famed for its lacquer work, may be reached from Mexico City by automobile, plane, bus, or train. The road to Parícutin is bad, dangerously so. Part of it is traveled by automobile over bridges constructed of two planks that are little wider than the tires, and part of it on horseback. At the journey's end you are at the edge of the lava flow. Here you must decide if you care to have a look at the crater. You have but two choices: walk across the lava—three and one-half miles as the crow flies—or go around it (a distance of twelve miles). Do not cut across if you are not surefooted or if you happen to tip the scale heavily. Go around it, and the chances are you will get there. Return by nightfall. It is hardly the place to be wandering around in the dark.

Battle of the Sexes . . .

THEIR DIET DIFFERENCES MAKE THEM DIFFERENT

By AUSTIN L. RAND
CURATOR OF BIRDS

I USED TO THINK that the battle of the sexes so ably portrayed by James Thurber in his drawings and in his prose was artificial, a man-made and woman-made thing, a product of civilization, certainly. Thurber, of course, only deals with one species of animal—humans. But recently I've come to see the competition between the sexes as widespread and of far-reaching consequences. It is probably as old in the animal world as sex iteslf.

In a booklet with the severe title *Secondary Sexual Characters and Ecological Competition*, published by the Museum, I've outlined the possibility of competition for food between the sexes being a factor in evolution and responsible in part for characteristics of structure and traits that distinguish the sexes.

In circles that discuss evolution the idea is current that food-competition is important between species. It may even be stated as a rule: two species with the same food habits cannot live in the same place. Competition drives one out unless the other has different food habits. Differences in food habits seem especially evident when you look at closely related species, and these differences are brought about in a variety of ways. One very common way is a difference in habitat. The long-eared owl hunts in the woods and its cousin, the short-eared owl, hunts in the meadows; the song sparrow favors drier shrubbery while its cousin, the swamp sparrow, lives in wetter shrubbery.

THE SIZE FACTOR

Another way is a difference in size. The downy and hairy woodpeckers of our woodlots are very similar except that one is larger and adapted to take larger prey while the other is smaller and adapted for smaller food items. Sometimes species feed differently. The Baltimore oriole picks flowers and pecks through their sides while the orchard oriole probes into flowers as they hang on the branches.

The same factors may be at work within a species. When a pair of birds "sets up housekeeping" and starts "raising a family" they can no longer drift about looking for easy living and places where food is plentiful. Their wanderings are restricted by having a fixed point, the nest, as their center of interest. The two individuals must draw on the food supply from an area about the nest. If their food habits were the same, competition would be extreme and, if food were scarce, perhaps critical.

We know how different in appearance the sexes may be—how different is the appearance of the rooster and the hen of our domestic fowl, the drake and the duck of the mallard, or the red male and the green female of the scarlet tanager. These sexual differences have been mostly correlated with display and mating. But logically there should be differences between the sexes in feeding behavior and food adaptations. The basic idea is contained in the old nursery rhyme:

> "Jack Spratt could eat no fat,
> His wife could eat no lean,
> So betwixt them both, you see,
> They licked the platter clean."

To the two birds of a mated pair, limited to a single area, it would be a decided advantage to have different food preferences or adaptations for food-getting. And we find that there are cases of this. The most striking is that of the huia of New Zealand, about which I've written in a recent BULLETIN (June, 1952). Both sexes have similar food preferences—both like especially wood-inhabiting insects—but they get their food in different ways. The male has a short, straight, stout bill for digging out the wood-boring grubs, woodpecker-fashion. The female has a long, slender, curved bill for probing into holes for them, creeper-fashion. The female may get grubs in wood too hard for the male to chisel.

DIET VARIATION BY SEX

It is possible that further study may bring to light additional cases of sex differences that are of advantage to the species in enabling the sexes to eat different things. The larger size of female hawks probably fits them to take larger prey than their smaller mates are able to take, and the smaller size of certain female songbirds probably fits them to take smaller prey than their larger mates can take. The larger bill of the male hornbill, the smaller bill of the female, the straight bill of the male western grebe, and the upturned bill of the female perhaps give each sex slightly different advantages in getting food.

Selection could have its effect in the populations, the forms with the greater difference in feeding habits of the sexes being the more successful in raising and leaving progeny. Thus, slowly, differences between the sexes would accumulate. However, it must be kept in mind that this sort of evolution would be limited. The drifting apart of the sexes would be checked by the necessity for their coming together periodically, for at least a short period, at nesting time.

HERPETOLOGIST RETURNS FROM WEST COAST

On February 4 Clifford H. Pope, Curator of Amphibians and Reptiles, left Chicago with a double purpose: to make a reptile and amphibian reconnaissance of the northern part of the western coast of Mexico and to study the habitats of the salamanders of our own West Coast. The lower parts of northwestern Mexico are too dry for salamanders, whereas the humid coastal regions of Washington, Oregon, and California are ideal for them and harbor one of the distinctive faunas of the world.

Two and a half months of work and 11,000 miles of travel were required to complete the project. All but two or three of the twenty-two salamander habitats were visited. Success of this part of the venture depended largely on two weather conditions, temperature and rain. The field trip was favored by abundant rain but hindered to some extent by cool weather. The low temperature was not a serious handicap but merely prevented the collecting of large series, a minor object of the work. One of the two habitats missed lay beneath the snows of the High Sierras and presented a considerable dilemma because at the time of the year when it is available most of the other habitats have already become too dry. It might be remarked that herpetological collectors are forever confronted by similar weather dilemmas, Curator Pope comments.

SEA OTTERS—

(*Continued from page 3*)

co-operation of the United States Fish and Wildlife Service. The time of year represented is March, before the sea growth such as kelp has appeared. The rocks are bare and the land partly covered by snow. A large male otter and a female with pup are shown resting on the rocks in a sheltered bay.

The U. S. Fish and Wildlife representative on Amchitka, Robert D. Jones, Jr., was host to the expedition and generously provided information about the otter as well as such material facilities as transportation, lodging, and food. The staff of the Arctic Health Research Center in Anchorage, Alaska, was extremely helpful in many ways. Major Robert Rausch of the Center, who is studying the parasites and diseases of the otter, accompanied the expedition. The Museum expresses its thanks also to the officers of Headquarters, Alaska Command, for permission to visit Amchitka, and to them and the Air Base officers at Shemya Island for transportation.

The animals were prepared for exhibition by Staff Taxidermist Frank C. Wonder. The background is the work of Artists Douglas E. Tibbitts and Leon L. Pray.

PHONOGRAPH RECORDS

AMERICAN BIRD SONGS, Volume II. Recorded by Dr. P. P. Kellogg and Dr. A. A. Allen. Comstock Publishing Company, Ithaca, New York. Fifty-one bird songs on five vinylite records. Price $10.50.

It scarcely needs to be stated that the voices of birds are equally of interest to the most technical of ornithologists and to the amateur naturalist and bird-lover. The new album of bird songs includes the voices of a series of ten familiar birds of gardens and shade trees, ten familiar birds of the roadside, nineteen birds of lakes and marshes, and twelve warblers. The quality of reproduction is greatly improved over that of the first album of bird songs and compares favorably in fidelity with the reproductions of frog voices in "Voices of the Night."

The capture on records of the voices of some of the birds most characteristic of the North American wilderness, like those of the common loon, whistling swan, and sandhill crane, is a triumph of ornithological field work. It is especially satisfying to have on record the voices of other marsh birds that are heard by the general public, or at least by the farm boy, but are not associated with the birds from which they come. The "slough-pumper" (bittern), the pied-billed grebe, and the rails may be named in this class. We ordinarily see so little of the transient warblers, on their way to their northern nesting grounds, that the series of notes of twelve species of warblers is of technical interest. Finally, it is comforting to be able to play the familiar bird songs of our dooryards to visiting children and other bird-lovers.

It should be mentioned that the Albert R. Brand Bird Song Foundation, of Cornell University, has made a magnificent record of some of the characteristic sounds of the Panama rain forest, at the Barro Colorado Island Laboratory, through a complete diurnal cycle from dawn to dusk and dusk to dawn.

KARL P. SCHMIDT
Chief Curator of Zoology

Botanist Returns from Cuba

Dr. B. E. Dahlgren, Curator Emeritus of Botany, recently returned from a field trip of nearly three months in Cuba. He continued studies, in which he has been engaged for several years past, of the Copernicia palms native to the provinces of Camaguey and Oriente. He was accompanied by John W. Thieret, a botanist from the University of Chicago.

NEW MEMBERS

The following persons became Museum Members from March 14 to April 15:

Associate Members

Thomas W. Alder, Frank C. Dumelle, Edward Howard Feinstein, Frederick D. Gardner, G. A. Huggins, E. A. Krider, Oren Elmer Miller, Miss Clara A. Scheiner

Annual Members

Lester H. Boatwright, Harry J. Burkema, John F. Christian, David Cohn, J. J. Collier, Harry L. Cook, A. Frank Coubeau, Frank F. Fowle, Jr., Mrs. Nellie T. Guernsey, Roy C. Ingersoll, Lester Ivry, T. L. Kelce, Rudolph Kelemen, Edmund Kutchins, Ferdinand W. Lagerholm, Hervey L. MacCowan, J. A. Middleton, W. F. Mont Pas, Miss Elizabeth Phelps, Emil T. Rank, Adolph A. Rubinson, Earle A. Shilton, G. A. Shields, Charles Lambert Smith, Harry Starr, Elmer H. Stonehouse, Walter Paul Suter, Albert B. Tucker, Leon F. Urbain, Maurice B. Vick, Dr. Mark Wicks, Truman Wood

PLEASE NOTIFY MUSEUM IF YOU'RE MOVING

Members of the Museum who change residence are urged to notify the Museum so that the BULLETIN and other communications may reach them promptly.

Members going away for extended periods may have Museum matter sent to their temporary addresses.

GIFTS TO THE MUSEUM

Following is a list of the principal gifts received during the past month:

Department of Botany:

From: Otto Rohweder, Hamburg, Germany—33 Commelinaceae and Bromeliaceae, San Salvador; Dr. E. E. Sherff, Chicago—11 type-specimen negatives

Department of Geology:

From: B. F. Hazel, Fort Peck, Mont.—2 fossil invertebrates, Montana

Department of Zoology:

From: A. Bognar, Whiting, Ind.—16 mammals, Indiana and Texas; University of California, College of Agriculture, Berkeley—5 beetles, Oregon and California; Dr. Alfred E. Emerson, Chicago—world-wide collection of termites; Lucien Harris, Jr., Avondale Estates, Ga.—2 cocoons of a skipper, Georgia; Harry Hoogstraal, Cairo, Egypt—49 worm snakes and 20 ticks, Egypt; H. Souza de Lopez, Rio de Janeiro, Brazil—19 lots of non-marine shells, Brazil; Dr. Henry van der Schalie, Ann Arbor, Mich.—collection of non-marine shells, Ontario, Canada

STAFF NOTES

Eugene S. Richardson, Jr., Curator of Fossil Invertebrates, presented a paper on "Techniques in the Study of Pennsylvanian Insects" before the meeting of the Pennsylvania Academy of Science held in April at Annville, Pennsylvania . . . . **Loren P. Woods,** Curator of Fishes, and **Robert F. Inger,** Assistant Curator of Fishes, last month attended the meetings of the American Society of Ichthyologists and Herpetologists in New York. Mr. Inger gave a paper on the distribution of the fresh-water fishes of Borneo . . . . Before his recent departure on a botanical expedition to "the lost world" area of Venezuela, **Dr. Julian A. Steyermark,** Curator of the Herbarium, was heard over Radio Station WBBM in an interview about his project. "Chuck" Wiley was the interviewer . . . . **Dr. Theodor Just,** Chief Curator of Botany, spoke on "Evolution and Paleobotany" at a seminar of the University of Notre Dame on April 14. He was also one of the speakers in a conference on "The Needs of Systematics" in Washington, D.C., April 22, under the auspices of the National Research Council.

Dallwig Lecture Season Ends

The popular Sunday afternoon "layman lectures" of Paul G. Dallwig ended for the current season with his appearances at the Museum during April. Mr. Dallwig will begin a new season in the autumn, for which details will be announced later.

He was the speaker at the April 23rd meeting of the Publicity Club of Chicago. His topic was "Let's Begin to Live."

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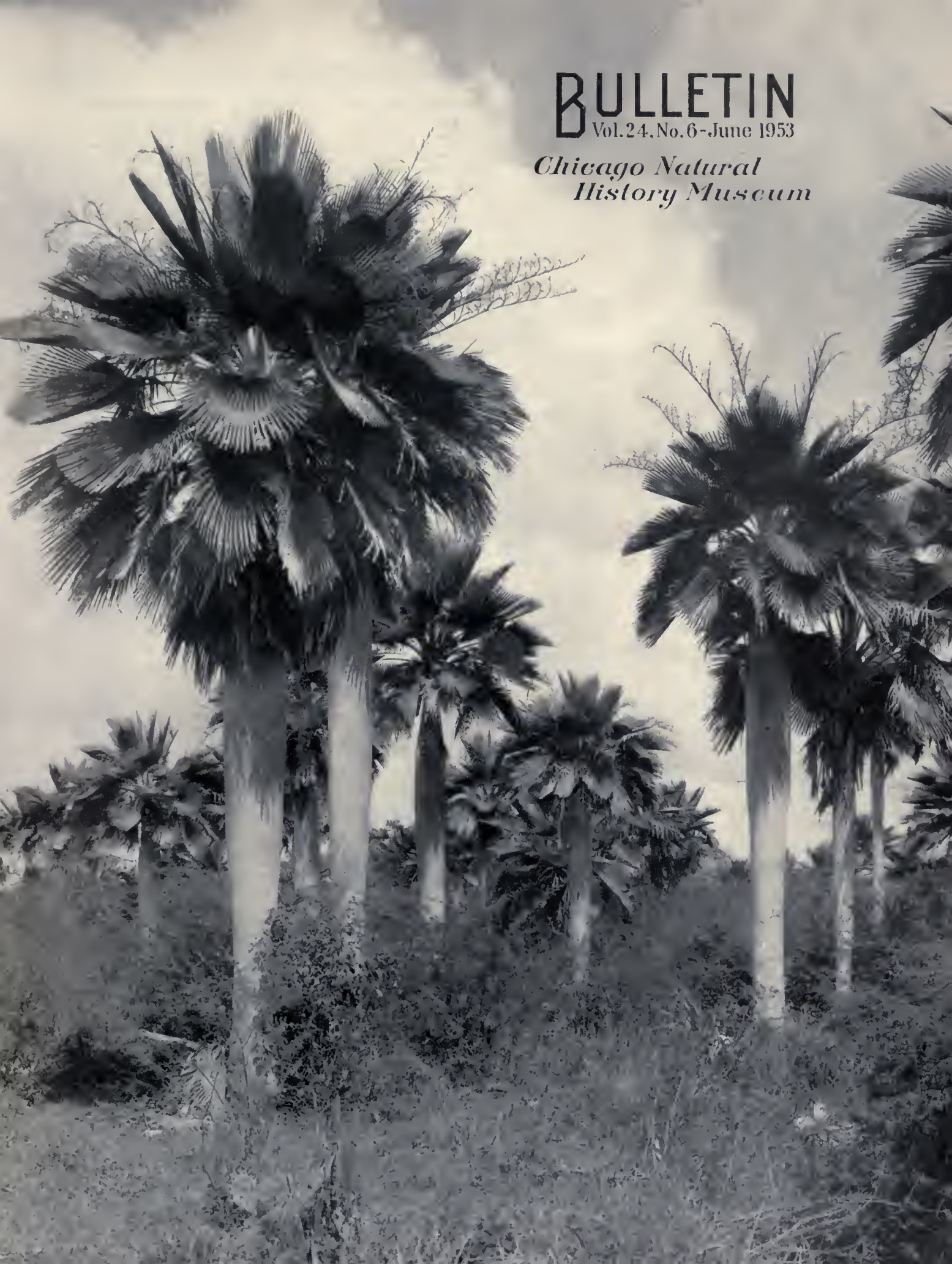

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Members are requested to inform the Museum promptly of changes of address.

NATURE PROVIDES AID TO SHELL COLLECTORS

It is by no means difficult to collect big shells, once the collector has learned where to look for them. However, for the smaller and smallest ones, it is a different matter, and it often takes hours to locate one or two specimens of snail shells of, say, one-sixteenth of an inch in length.

Fortunately, nature has provided an easier way that produces better results. Various animals of medium size, both in fresh water and the ocean, have developed a keen interest in tiny shells, though for reasons quite different from the human collector's. For instance, the larvae of some caddisflies use minute fresh-water shells, snails as well as clams, to cover their cases. Thus the collector will find all the small species of shells that live together with these caddisflies represented on their cases.

On the seashore, especially in warm and tropical regions where the beaches are covered with coralline growth and this growth is covered again with sessile animals and sea plants that offer ideal hiding places, it is almost impossible to look for individual minute shells. In this situation bigger animals, such as starfish, sea-cucumbers, and sea-slugs, feed upon smaller animal life and, among it, on very little shells. By opening the stomachs of these animals of prey, the collector will find, with far less effort and in far shorter time than if he had to rely on his own resources, numbers of the very tiniest shells that often contain animals still alive.

FRITZ HAAS
Curator of Lower Invertebrates

Museum Trustee and Director Win Freedom Awards

Clarence B. Randall, a Trustee of the Museum, and Colonel Clifford C. Gregg, Director, will both be honored with Freedoms Foundation Awards for 1952 at a presentation to be held by the Freedoms Foundation at the Chicago Club on June 3. The awards were first announced at Valley Forge, Pennsylvania, on February 22.

The award to Mr. Randall, who is chairman of the board of Inland Steel Company, is in the magazine-article category, in recognition of the excellence of his authorship of "Free Enterprise Is Not a Hunting License" published in *The Atlantic Monthly*.

The award to Colonel Gregg is in the public-address category in recognition of merit for his talk, "Renewing Our Faith in Freedom," made before the Y.M.C.A. of Springfield, Illinois, at its annual retreat last September.

Freedoms Foundation is a nonprofit, nonpolitical, nonsectarian organization devoted to "bringing about a better understanding of the American way of life." Each of the awards will consist of the Foundation's George Washington Honor Medal and a check for one hundred dollars.

Curator Wins Fellowship

In recognition of scholarship, Dr. Robert H. Denison, Curator of Fossil Fishes, has been awarded a John Simon Guggenheim Memorial Foundation fellowship for studies on paleozoic vertebrates in Norway, Sweden, and England. He is scheduled to go to Europe in August.

Clarence Mitchell Engaged In European Project

Color photographs for use in the Museum's educational work are being made in France and Switzerland by Clarence B. Mitchell of Chicago. Mr. Mitchell, whose contributions to the Museum several years ago resulted in his election to the roll of Contributors, is also Research Associate in Photography on the Museum staff and the present undertaking is being carried out in the latter capacity. He and Mrs. Mitchell sailed for Europe on May 8 and are expected to return about July 1.

Mr. Mitchell will seek unusual examples of various kinds of terrain to illustrate phases of geology and stands of trees, flowers, and other plants typical of wild floras in a variety of ecological situations. Both the geological and botanical color-pictures will be used for slides and other illustrative material in lectures presented for children by the Museum's James Nelson and Anna Louise Raymond Foundation for Public School and Children's Lectures. Mr. Mitchell is the photographer of an entire book of color pictures of Museum exhibits published by the institution under the title *Colorama*, which is still one of the most popular items in the Museum's Book Shop.

THIS MONTH'S COVER

Our cover shows a stand of Yarey palms, some of the largest and most magnificent of the many kinds of Copernicia palms in Cuba. They are abundant in some of the eastern parts of the island where in certain districts they form large stands—in some places pure, in others mixed with one or two other species, but until recently left undisturbed. The photograph was made by Dr. B. E. Dahlgren, Curator Emeritus of Botany, who recently returned from a Museum expedition to Cuba. Dr. Dahlgren reports: "With the great increase in cattle breeding that has come with the introduction and admixture of Brahma stock, almost all nonagricultural land is now being cleared for grazing. Under the onslaught of bulldozers, large stands of palms disappear from one week to another, together with the spiny shrub that has invaded most of the old pastures, the whole turned into masses of wreckage pushed into heaps for burning. Thus, of the large 'yareyal' or stand of Yareys of which the photograph shows a small part, only a few outlying and less accessible individual palms now remain."

Gifts to the Museum

Following is a list of the principal gifts received during the past month:

Department of Anthropology:

From: C. F. Childs, Lake Forest, Ill.—temple lamp, Tibet

Department of Botany:

From: United States Customs Service, Chicago—*Lagerstroemia speciosa*, Siam; New York Botanical Garden—*Dahlia foeniculifolia*, Mexico

Library:

From: Robert Trier, Chicago; Charles J. Erasmus, Bogota, Colombia

'UNEXPLORED CHICAGO' IS PROMISING FIELD

By ELAINE BLUHM
ASSISTANT IN ARCHAEOLOGY

EVERY YEAR people come to the Museum with boxes of arrowheads and scrapers that they have collected on farms and Forest Preserve paths around Chicago and the suburbs. They want the archaeologists to identify these specimens. "How old are they?" they ask. "How valuable are they?" If they bring only arrowheads or spear heads, frequently it is hard to tell how old the specimens are, for, although the early Indians made more large points and later Indians made more small ones, some large ones are usually found on late sites. It is easier to estimate the age of pottery fragments, for the form and method of manufacture of pottery changed more through time; but pottery is hard to find because often it looks like the ground itself.

The scientific value of the artifacts to the archaeologist depends on the information that comes with them. A random collection —a knife from Illinois, a point from Wisconsin, and a scraper from Michigan—is of less value than a group of tools from a given field with a definite location. If the collector has picked up not only arrowheads but also scrapers, knives, worked flint chips, and perhaps even pieces of broken pottery, he brings in a better picture of the culture of the Indians who lived on the site, and it is easier to estimate the age of the collection.

LOCAL ARCHAEOLOGY LITTLE KNOWN

Actually, if we were to draw a map of the state of Illinois and indicate on it the areas that have been well explored and are well known archaeologically, we would have to mark the area around Chicago "unexplored." Although archaeologists from the various schools and museums in the state have spent considerable time exploring and digging in central and southern Illinois, few have done any work in the region now covered by Lake, Cook, and Du Page counties.

We know, from the records of LaSalle, Joliet, and other early explorers, that the Miami Indians lived about 1600 where Chicago now stands and that the Illinois tribe was living farther south around what is now Starved Rock and Ottawa, Illinois. By 1800 the Miami had moved south and the Potawatomi were on hand to greet John Kinzie when he settled here in 1803. The exhibits in Mary D. Sturges Hall (Hall 5) show costumes, tools, and weapons of these historic Indians of the Chicago region.

But of the prehistory of the region—the time before written records whose story can be told only by uncovering and interpreting the archaeological record—we know very little. Early settlers had little time for collecting Indian relics and by the time people became interested in the earliest inhabitants of the area, much of the modern city and its suburbs were built on the old sites. Only because archaeologists know what has been found in the neighboring areas can they predict what may be found in the Chicago region. In James Nelson and Anna Louise Raymond Hall (Hall 4) several of the exhibits grouped under the title "Indians Before Columbus" show stone, shell, and bone tools and pottery like those we may expect to have come from local sites.

THIRTY CENTURIES AGO

The earliest people, whom we might call Early Hunters, made no pottery. They hunted animals with spears tipped with large stone spear points, often one and one-half to three inches long. They gathered

ANCIENT HARDWARE OF CHICAGO AREA
The Late Mississippi Indians who inhabited the region now dominated by America's second city may have made tools and utensils like those of their Fort Ancient neighbors to the east. This exhibit is in Hall 4, devoted to Indians before Columbus.

seeds and nuts for food and ground them on a mortar, a stone with a depression in the center. The skins they wore were scraped and cleaned with small pieces of flint with edges sharpened by chipping. These hunters may have lived in this area more than 3,000 years ago.

When these early hunters began to settle down, about 800 B.C. to 400 B.C., and live in villages, they began to make pottery. This pottery, called Early Woodland, is crude and thick, and often it has impressions of cords or cloth on both inside and outside. These Early Woodland people still made

(*Continued on page 4, column 2*)

SOUTHWEST EXPEDITION DIGS AT A MYSTERY

(The 1953 Southwest Archaeological Expedition of the Museum has begun its season of operations in the Pine Lawn Valley area of west-central New Mexico, near the town of Reserve. Dr. Paul S. Martin, Chief Curator of Anthropology, who is leader of the expedition, and Dr. John B. Rinaldo, Assistant in Archaeology, left for the field late in May. As work proceeds, additional archaeologists and other helpers will join the Museum men on the "dig." Excavations and research will be continued until some time in September. This is the nineteenth in the series of expeditions to the Southwest and the tenth year in which work has centered on the New Mexico sites. In the accompanying article, Dr. Martin tells what has been accomplished in past years and why further digging and research are needed in order to picture life among the prehistoric Mogollon Indians.)

By PAUL S. MARTIN
CHIEF CURATOR, DEPARTMENT OF ANTHROPOLOGY

LET US SUPPOSE that you owned a comfortable home in a beautiful pine forest surrounded by mountains and that a means of livelihood was at hand. Would you suddenly abandon your home, work, and beautiful surroundings and move elsewhere unless you had a very good reason for doing so? I certainly would not, unless I were actually shoved out.

Yet this is exactly what the Mogollon Indians did. For nearly 4,000 years they had built homes, hunted, and gathered wild foods—had planted corn, beans, squash, made pottery, and performed religious rites —in short, had carried on all the essentials of a happy, well-organized, well-rounded existence—and then—poof!—had abandoned the Pine Lawn Valley area of what is now New Mexico.

What powerful force or forces caused this action?

We do not yet know.

The past expeditions of the Museum, however, have amassed a considerable amount of information. In an attempt to find out more, the 1953 Southwest Archaeological Expedition is now going into the field to dig further on sites in the vicinity of Reserve, New Mexico, the same general area where excavations have been conducted for the past nine years.

HISTORICAL GAPS REMAIN

To get the scene in focus, let us backtrack a few thousand years. Our series of intensive excavations, one of the longest-continued operations of the kind ever conducted in the Southwest, has enabled us to piece together a considerable part of the panorama of Mogollon history—but there are still uncertainties about its beginning and end, and there are large gaps in between as well.

Recovering history with pick and shovel is no easy task. Perhaps we might liken it

to reading texts written in a strange language—a "language" that consists of sherds (fragments of pottery), tools of stone and bone, sandals, textiles, wooden objects, implements of ceremony, chase, and war, dimensions of houses, storage pits, firepits, and postholes, and even of corncobs, bean pods, squash rinds, and other refuse that might impolitely be called "garbage"!

But when all these finds are winnowed, statistically manipulated, charted, and mulled over, we come up with an amazing amount of information about these Indians and the way they lived. We not only can date, with fair precision, the materials and houses that we excavate, but we can even make a fair guess as to the way these Indians organized themselves in order to carry out various objectives in a fairly efficient manner.

FLIGHT FROM DROUGHT

Briefly, our story of the Mogollon Indians begins at about 2500 B.C., at which time, because of drought, they had abandoned their homelands in what is now southern Arizona. They camped in Pine Lawn Valley (located in what we now call west-central New Mexico) because it was verdant and well watered. There, as I said earlier, they lived for several millennia. At first their houses may have been skin shelters or tents. Later they lived in pit-houses (circular or rectangular houses about 12 to 15 feet across, floors of which were excavated to a depth of about 2 feet), and still later (about A.D. 1000) they lived in communal apartment houses (of one story) built with masonry walls or in cliff dwellings. The idea of planting crops (maize) may have been introduced to them (from the south, by diffusion) soon after their arrival in Pine Lawn Valley, and the art of pottery making became one of their specialties as early as the beginning of the Christian era.

As we regard their handiwork we note slow but steady progress in everything they undertook. At about the time the Normans were invading England, the Mogollon Indians had reached a modest level of accomplishment. And in the next century or two (up to about 1350) they had progressed even more—at least as far as material things were concerned.

CLUES RUN OUT

Then for some reason or reasons, not yet known, they decamped. Where they went is also a mystery. Several possible causes for the abandonment of the area come to mind: a change in climate that might make the area too wet or too dry, enemies, intervillage wars or squabbles, an epidemic of some kind, psychological causes (ceremonial or ritualistic signs manifested to the priests). None of these seems entirely plausible to us, and I must admit we are entirely in the dark on the subject.

At any rate, the people did move out of the Pine Lawn Valley and the Reserve area about A.D. 1350 or 1400, and we are going to try to find out why they went and where. This is a difficult but important problem and we may not succeed in solving it. But we have a hunch—and nothing more—that the Mogollon Indians moved north and westward. If we obtain good evidence on this point, we plan to move our camp within the next year or so in order to follow through investigations of this interesting and little-understood culture.

'UNEXPLORED CHICAGO'—

(Continued from page 3)

large flint projectile points for their weapons, as did the Early Hunters, and used knives and scrapers.

Then about 2,000 years ago came the Indians who built large burial mounts to cover the cremated or buried remains of their dead and cut elaborate ornaments of mica and copper. They are called the Hopewellian Indians because evidence of this culture was first found on the Hopewell farm in Ohio. They raised corn and other crops and lived in villages now indicated only by fields covered with projectile points, scrapers, knives, and pieces of brown pottery that is thinner and better made than pottery of the Early Woodland group. This pottery is often cord-marked on the outside; that is, when the Indians were shaping the pots they thinned them by pounding the outside with a paddle wrapped with cords that left an impression on the outer surface. Some pottery is also decorated with incised lines and punched designs. In Ohio, cloth fragments found in some of the burial mounds, where they have been preserved by the copper fragments that lay on them, indicate that the Indians knew how to weave.

CLUES TO HISTORY

Fragments of pottery, projectile points, and flint chips are the only records of Hopewellian Indian villages left for study by today's archaeologists.

LATER TRIBES

Last are the sites occupied by Indians shortly before the white man arrived. Late Mississippi is the name given to this culture. Some of the plain brown pottery has small white specks in it—shell temper, the archaeologist calls it. Other pottery is grit-tempered. Some is cord-marked. Many projectile points used by the Late Mississippi Indians were small, often less than one inch long. Usually they were triangular in shape, and all were carefully chipped. In the village refuse we find spoons and ornaments made of clam shells, bone awls and needles, flint scrapers, and hoes made of shoulder blades of large animals. Evidently these people ate fish and clams from the river in addition to the corn raised on their fields, for their refuse areas contain many shells and fish bones. Their cemeteries were small conical mounds near villages. The Upper Mississippi people probably were the ancestors of some of the Indians who first greeted the early French explorers.

Archaeologists then can assume that there were Early Hunters and Early Woodland, Hopewellian, and Late Mississippi farmers in the Chicago region because they know such groups lived in Indiana, central Illinois, and Wisconsin. People who come to the Museum with their collections, who know where they found them and who have a record of the things that were found together in the same field, are helping the archaeologists check their assumptions and write the prehistory of the Chicago area.

David Wenner of LaGrange, Illinois, a former professional archaeologist at one time associated with the Missouri River Basin Archaeological Survey in Oklahoma, is now interested in this problem of the archaeology of the Chicago area. He has been exploring likely areas for evidence of Indian camps and villages and has examined collections made by many people in this area. Interested members of the staff of the Department of Anthropology of the Museum are co-operating with Mr. Wenner in his efforts to learn more of the prehistory of Chicago.

Botanical Expedition to Tennessee And North Carolina

An expedition to collect material needed for the Hall of North American Woods (Hall 26) will be undertaken in June by Emil Sella, Curator of Exhibits in the Department of Botany. Mr. Sella will collect in the Great Smoky Mountain National Park of Tennessee and in parts of North Carolina. In addition to wood plants, he will seek other characteristic representatives of the flora of the southeastern states.

ANCIENT ILLINOIS INSECTS FLOURISHED IN COAL SWAMPS

By EUGENE S. RICHARDSON, Jr.
CURATOR OF FOSSIL INVERTEBRATES

THE OLDEST winged insects that we know flourished in the rich coal swamp forests in the Pennsylvanian period, beginning 280 million years ago. Great is their age, and great is their diversity, as it was even in those far-off times, when they left their wings to become fossilized with the leaves of the coal trees.

FOSSIL-BEARING NODULE

It contains an impression of an insect wing. This and other nodules collected for the Museum around Braidwood, Illinois, are of Middle Pennsylvanian age, or about 250 million years old.

The oldest among the insect groups (orders) now living are, very surprisingly, cicada-like insects, and next to these, the roaches. These, indeed, are the only orders of insects surviving of a considerable company of orders that lived in the Pennsylvanian period. The others either died out entirely or changed in the gradual process of evolution into more familiar forms. As competitors, the earliest cicadas and roaches had the ancestors of our dragonflies and grasshoppers, many of them larger than most modern insects, if we may set aside certain legends of Texas and Alaska mosquitoes.

The coming of the insect season happily coincides with the coming of the field season, the time when weather and roads are again suitable for gathering fossils and other specimens for the Museum collections. This year George Langford, Curator of Fossil Plants, and I will again undertake several trips to the coal-stripping area near Braidwood, about fifty miles south of Chicago. Here, in great piles of waste clay, cast aside in uncovering the coal, are the fossil-bearing nodules, delight of amateur and professional alike.

Nodules are rounded stones formed by the hardening of a soft shale around a fossil as a core. Probably the organic substance of the fossil, in its decay or carbonization, promotes the deposition of mineral around the fossil, thus forming the nodule soon after the leaf or insect wing is originally buried. Nodules occur by the hundreds on the spoil heaps, where the unhardened shale, exposed to the weather, soon falls to clay. In the course of a day's collecting one gathers and cracks a few bushels of them.

But many bushels of nodules must be cracked before a single fossil insect appears. Next to the small amphibians and certain scarce plants, insects are the rarest of fossils from Braidwood and are prized accordingly. Nevertheless, if we include the small outcrop of the same nodule-bearing shale on the banks of Mazon Creek, a few miles to the west, this is one of the world's most productive and illustrious Pennsylvanian insect localities. One hundred and thirty-five species of insects have been described from the Braidwood and Mazon Creek nodules, and others in the Museum collection are now being studied.

What kinds of insects were these that flitted through the primeval forest of Illinois? They were two main types: those that kept their wings outstretched (Paleoptera) and those that folded them back when not flying (Neoptera). The Paleoptera are the more primitive type, but already 250 million years ago, in the middle of the Pennsylvanian period, they were in the minority. Of the Braidwood insects, only a seventh part belongs in the three paleopterous orders, including one species close to the ancestral line of the dragonflies. There were about thirty species of roaches, most of them rather larger than the common house roach. Almost all of the other insects belonged to a large, now extinct, neopterous order, known as the Protorthoptera, ancestors of our katydids, grasshoppers, and crickets. The Neoptera had an advantage in the competition for survival, for their delicate and important wings were safe from damage when folded back.

The two wings shown in accompanying illustrations are typical of the Protorthoptera in the Museum's collection, representing hitherto unpublished species. The veins supporting the wing membranes are more numerous than in most modern insects. Reduction in wing veins, accompanied by changes in the body, is a characteristic step in insect evolution. Some specimens of Braidwood insects have both wings and bodies, and are the oldest complete insects known. Older Pennsylvanian deposits yield solitary wings, and most of the Braidwood specimens, too, consist of wings alone.

Thus a study of Pennsylvanian insects must place much weight on the characters of the fossil wings. Scientific descriptions, which must always be published when a new species is named, are devoted to matching ("homologizing") the veins with those of other known insect species. Fortunately, there is enough possibility of variation in wing veins to make them excellent characters for study of classification and evolution of insects.

DRAGONFLY WITH TWO-FOOT WING SPREAD

Restoration of giant insect in the Museum's habitat group of a Coal Age forest showing it as it is believed to have appeared in life about 250 million years ago. The Museum scientists and artisans were guided in preparing the dragonfly model by data on the six known fossil specimens found in a strip-mine dump in central France, a deposit slightly more recent than that in northern Illinois.

MODEL OF FOSSIL INSECT WING

Made by running a cellulose solution over the fossil impression in a Braidwood, Illinois, nodule and peeling it off after it has dried.

Fortunately, too, the impressions of wings in the Braidwood nodules are so clear that all veins are visible. The swamp mud that covered the wings ages ago was almost as fine-grained as modeling clay, forming an ideal medium for preserving delicate markings. This is true for the other fossils in the nodules as well as for the insects. So the time spent in cracking nodules in search of insect wings is well spent even on those days when no insects appear, and thus the Museum is annually enriched by several hundred specimens of finely preserved fossil plants.

HOW BIRDS USE COWS AS HUNTING DOGS

By AUSTIN L. RAND
CURATOR OF BIRDS

THE SPORTSMAN out for quail or woodcock uses dogs to drive out the birds for him. Starlings and cowbirds around Chicago use the same principle in hunting grasshoppers. Instead of dogs they use cows, though of course the cows are intent on something else and presumably unconscious of the fact they're helping the birds.

As the cow grazes slowly across a meadow, it scares up grasshoppers close in front of it. The cowbirds and starlings take advantage of this. Instead of covering the meadow on foot, constantly alert to pounce on a sitting grasshopper or to chase one they flush, the birds tag along with a grazing cow. They take up a position by the head or a foot and catch the insects the cow disturbs. The cow is so much larger than the bird that it is likely to flush more insects. Grasshoppers on the wing are much easier to see than those at rest in the concealing grass, and some fly directly toward the bird. Too, the grasshoppers fleeing a cow are less likely to be alert to other dangers.

CONFIRMED BY OBSERVATION

The advantages of this to the bird are obvious—at least, we've assumed they were. But until recently we had no data on the relative efficiency of the two methods of hunting. Recently, however, while in El Salvador, I was able to get quantitative data that proved that using a cow as a beater was as advantageous as we had suspected and showed how much more effective it was, something we did not know.

The bird concerned was not the starling, which does not occur there, nor a cowbird, which occurs but consorts little with cows, but was the grooved-billed ani, a tropical American black cuckoo about 12 inches long. Like our starling and our cowbird, it kept with cows, catching grasshoppers and other insects that flew up. Both anis and cows were common in the grassy fields about our headquarters in San Salvador. My son Stanley and I decided to watch anis with cows for a few hours, and then without cows for a few hours, thus getting the average rate for each type of feeding. We quickly found it wasn't as easy as that. Something always happened; even on the levelest and most open fields the birds were constantly disappearing behind a tuft of grass, or in a hollow, or if nothing else, behind the cow's head or feet. Then, too, the ani wouldn't pay attention to the job in hand. It would wander off, or go to sleep. And sometimes, when we were about to discontinue watching a somnolent bird, it would snap up an insect. Perhaps it had been watching all the time. Finally we found we had to record many short periods, from three to fourteen minutes each, and add them together.

By dint of much patient watching we got our data. In the dry season when insects were scarce and the grass short, it took an ani, hunting alone, two minutes on the average to find an insect. In the same length of time hunting with a cow, the catch averaged three insects. Thus hunting with a cow as a beater was three times as effective as hunting alone.

The effect of the change of the season in abundance of food for the ani was very striking. In the wet season the grass began to grow fast, and insects became common. Then the anis had an easy time. Without a cow, an ani averaged between three and four insects a minute, more than six times as many as in dry times. There was less incentive to use a cow as a beater, with food so abundant, but when the ani did so, its rate of finding insects was still higher: between four and five insects per minute. In a table it looks like this:

Average Number of Insects per Minute Found by Ani Feeding

	Without Cow	With Cow
Dry Season	.5	1.5
Wet Season	3.4	4.7

But the three times greater results in a given time in the dry season do not tell the whole story as to the effectiveness of using a beater. When an ani was hunting by itself it walked about covering a surprisingly large amount of ground. When using a cow as a beater, not only did it catch more insects in a given length of time, but it also walked about much less, saving a great deal of energy.

This is not true co-operation between cow and bird, for they're not working together toward a common end. It's not exploitation of the cow by the birds, for the cows lose nothing. It is closer to a form of harmless parasitism, for the ani profits from the activities of the cow without either harming or helping the cow. It also illustrates how sharp birds are—ready to take advantage of any factor in their environment that will help them get their food.

DALLWIG LECTURES SCORE ANOTHER RECORD

A new record for attendance was chalked up in the 1952–53 season of Sunday afternoon "Layman Lectures" at the Museum by Paul G. Dallwig. Mr. Dallwig lectured each Sunday in November, December, January, March, and April, and his audiences in this, his thirteenth season, totaled 4,504 or an average of 205 for each lecture. These figures compare with a total of 4,229 and an average per Sunday of 186 in the 1951–52 season, which was the largest of the twelve previous seasons in which Mr. Dallwig has lectured. The number of requests for reservations exceeded 15,000 in both of the last two seasons. The lectures are presented partly in a lecture room and partly in exhibition halls containing material illustrating the subjects and therefore audiences necessarily are limited in size. Various innovations, such as "turnabout chairs" and temporary chairs in exhibition halls, have been tried in an effort to accommodate an audience of the maximum size practicable.

Mr. Dallwig, a Chicago businessman with an avid interest in science that inspires his studies and the resulting dramatized lectures he gives, engages in this work without compensation purely as a service to the public and to the Museum and as a contribution to the cause of adult education. The Museum administration congratulates him on his continued success and offers its gratitude for the time and effort he puts into this task.

Subjects presented by Mr. Dallwig in the season just closed were: "Mysterious 'Night-Riders' of the Sky," "Money Does Grow on Trees," "Life—What Is It," "A Museum Zoo is Exciting Too," and "Living Races and Their Way of Life."

A new series of lectures will be presented by Mr. Dallwig beginning with the first Sunday in November. Reservations for these will be accepted from October 1. Members of the Museum do not require reservations. They are welcome to attend upon presentation of membership cards.

Daily Guide-Lectures

Free afternoon guide-lecture tours are offered daily except Sundays under the title "Highlights of the Exhibits." These tours are designed to give a general idea of the entire Museum and its scope of activities. They begin at 2 P.M. on Monday through Friday and at 2:30 P.M. on Saturday.

Special tours on subjects within the range of the Museum exhibits are available at other hours, morning or afternoon, Mondays through Fridays, for parties of ten or more persons. Requests for such service must be made at least one week in advance.

Although there are no tours on Sundays, the Museum is open to visitors as usual from 9 A.M. to 6 P.M.

CHANNEL 11 WOULD WIDEN INFLUENCE OF MUSEUM

After the war, which brought a speedup of technological progress, television on a mass-audience scale came into being. This new medium of communication was seen by many as an opportunity to bring more of the good things of life into homes where they had been hitherto unavailable. However, the purely public-service functions of TV were and are restricted by the necessity for commercial stations and networks to maintain a balanced financial operation. Finally, in an effort to fulfill the promise of

RADIUS OF PROJECTED CHICAGO EDUCATIONAL TV

Scores of communities within 60 miles of Chicago, as well as the city itself, will see and hear cultural programs if the campaign for a television station on Channel 11 succeeds. The FCC deadline is June 2.

cational television here. It has been estimated that approximately $550,000 will be required to build and equip the station. Plans at present are to remodel Manley Vocational High School at 2935 West Polk Street for the purpose. A like amount will be required to operate the station for two years, bringing the total to $1,100,000.

Of this the Ford Foundation has promised $150,000, provided that at least twice that amount is raised locally. The Chicago Board of Education has set aside $150,000 for the Manley School project. The remaining $800,000 is up to the community, and a "grass-roots" drive among the city's 1,300,000 television set owners is proving successful. No contribution is too small or too large, and the checks of interested supporters will be welcomed by the Channel 11 Fund Headquarters, Box 1100, Chicago 90.

On April 14 the Chicago Educational Television Association was incorporated under the General Not For Profit Corporation Act of the State of Illinois. The purpose of the corporation is "to obtain and hold a television license . . . for the promotion of the cultural, educational, and civic welfare of the citizens of Chicago and the surrounding area, such license to be for nonprofiit and noncommercial television broadcast service."

harnessing this new technique to the service of culture and self-improvement, the Federal Communications Commission reserved 242 channels for educational use throughout the country.

But reservation of these channels is certain only until June 2 this year. Unless communities are able to demonstrate substantial interest in educational television by that time, these valuable frequencies may be made available to commercial enterprises.

In Chicago, to which Channel 11 has been assigned, interest has been running high and it has been possible to organize, under the chairmanship of Edward L. Ryerson, a campaign that promises to oversubscribe the minimum of $800,000 needed to assure edu-

Fifteen leading citizens of Greater Chicago have agreed to serve on the Association's Board of Trustees. An Educational Advisory Board consisting of representatives of co-operating educational isntitutions has been formed. The Museum's Director, Colonel Clifford C. Gregg, is one of three temporary trustees of the fund, the others being Daniel Catton Rich, Director of the Art Institute of Chicago, and Dr. John T. Rettaliata, President of Illinois Institute of Technology. John R. Millar, Deputy Director of the Museum is a member of the Educational Advisory Board, with representatives of other institutions.

These institutions see television as a great new instrument for achieving some of their traditional objectives. It is a busy world and, as much as we might desire to, most of us are unable to take advantage of all the educational opportunities available. We would participate in more of them if they were brought to us. Television could help.

The Museum's basic function is twofold. Its exhibits are a means of educating, and the research work of its staff of scientists results in the acquisition of knowledge about our world that can be obtained only by especially qualified investigators. Such conquest of ignorance is sought on the premise that a correct understanding of natural processes makes it possible for the world's inhabitants to live better lives together. Of course, such knowledge is effective in direct proportion to the number of people who possess it. The potential of television as a means for transmitting knowledge of the natural sciences in a new and interesting way seems tremendous.

STAFF NOTES

Four members of the Anthropology staff attended the joint meetings of the Society for American Archaeology and the Central States Anthropological Society held at the University of Illinois in Champaign-Urbana from May 7 to 9. **Donald Collier**, Curator of South American Ethnology and Archaeology, who was elected president of the Central States group, presented a paper in a symposium on cultural ecology of the Plains Indians. **Dr. John B. Rinaldo**, Assistant Curator of Archaeology, participated in a discussion of use and abuse of the concept of areal co-tradition and conducted a work-session of archaeological classification. The others attending were **George I. Quimby**, Curator of Exhibits, who was elected first vice-president of the Society for American Archaeology, and **Miss Elaine Bluhm**, Assistant in Archaeology . . . . **D. Dwight Davis**, Curator of Vertebrate Anatomy, recently presented a series of four lectures on morphology and evolution at the California Institute of Technology. At a meeting of the American Society of Ichthyologists and Herpetologists he showed a Museum motion-picture illustrating the burrowing habits of the African sand viper and presented a commentary . . . . **Dr. Karl P. Schmidt**, Chief Curator of Zoology, was elected a Fellow of the Chicago Academy of Sciences at the academy's recent 96th annual meeting . . . **Dr. Theodor Just**, Chief Curator of Botany, addressed the Earth Science Club of Northern Illinois at Downers Grove High School on May 8. His subject was "Living and Fossil Cycads." . . . **Miss Marie Svoboda** of the Raymond Foundation lecture staff has been awarded a master of arts degree in education by Northwestern University where she also earned her bachelor of arts degree.

ARTS OF LAPIDARISTS IN SPECIAL EXHIBIT

FOR THE THIRD successive year the "rock hounds" of the Chicago area are bringing their show to the Museum. "Rock hounds" is the vernacular name for the amateur lapidarists who go far afield to collect raw gem material and then spend many hours at night for weeks at a stretch on their avocation of cutting and polishing the stones and fashioning them into various objects of art and jewelry. Their products often rival those of professional workers in this craft.

Opening June 6, the Third Annual Amateur Handcrafted Gem and Jewelry Competitive Exhibition, sponsored by the Chicago Lapidary Club, will present its display of prize-winning creations in Stanley Field Hall of the Museum. This special exhibit will continue through June 30.

TWO INNOVATIONS

Some of the exhibits in this year's show represent the debut of the amateur gem enthusiasts into two new fields of endeavor—enameling on precious metals and cutting faceted gems. Hitherto their cutting operations were confined to cabochon cuts and polished slabs. Three types of faceting are represented—the type labeled "brilliant," which is primarily applied to diamonds, and the "emerald" and "step" cuts, both usually employed in preparing emeralds. The step cut, most complex of the three, has been applied on show pieces of topaz of several varieties—clear, Texas or sky-blue, yellow, and brown. The faceted pieces are mounted, or ready for mounting, in jewelry.

The eight other classifications of exhibits, continued from the setup established at the previous shows, are: Individual gems (cut stones without settings, single entries); specific gem collections (all of one kind of stone); general gem collections (different kinds of stones assembled together); individual jewelry pieces (single entries); jewelry sets (matching pieces made to be worn together); jewelry collections; polished slab collections; and individual pieces (artistic and utilitarian objects such as bookends carved from blocks of various stones). Individual items entered have a wide range. The examples of gem cutting embrace more than a hundred different kinds of precious and semiprecious stones and the fabricated objects in which the gems are mounted in gold and silver include rings, brooches, necklaces, pendants, bracelets, earrings, and tieclasps. One of the more elaborate entries is a full set of table silverware with jeweled handles of polished agate.

For this year's show, 146 persons participated in the contest, with a total of 226 entries that, because some single entries include up to 100 individual stones, aggregate approximately 500 individual items. This, like the other contests of the Chicago Lapidary Club, was open to amateur lapidarists throughout the region within a 100-mile radius of Chicago and was not limited to the membership of the sponsoring club. Other clubs co-operated, and persons who are not members of any clubs were welcomed.

NUMEROUS AWARDS

The practice of past years of classifying contestants into two principal groups was again followed. Those with experience of less than two years form a group labeled "novices," while those with more than two years in the craft are designated as "advanced lapidarists." There are ten divisions in each of these classifications. Blue, red, and yellow ribbons for each division of each group are awarded. First prize in each group is a gold-plated medal. For the display deemed by the judges as "best in the show" a jeweled medal is awarded.

The exhibits in this year's show represent a total value estimated at about $175,000. After the close of the display in the Museum, they will be shown for three weeks in the State Street store of C. D. Peacock and Company, jewelers.

Committee chairman of the 1953 exhibition is Lyman Carpenter, an engineer for the Commonwealth Edison Company. Joseph C. Arey, an engineer for the Sanitary District of Chicago, is president of the Chicago Lapidary Club. The club has moved from its former headquarters at Grand Crossing Park field house to the field house at Gage Park, 55th Street and Western Avenue, where shop facilities are available to its members for the practice of their craft. The use of machinery and tools in several other small parks of the Chicago Park District is likewise extended to members of this and other clubs and to nonaffiliated amateur lapidarists.

NEW MEMBERS

The following persons became Museum Members from April 16 to May 15:

Life Members

Edward Alexander, George A. Bates

Non-Resident Life Members

Mrs. Robert H. Murray

Associate Members

J. L. Holloway, E. J. Knudtzon, Chester G. Moore, Mrs. Charles W. Schonne, Lyman M. Simpson, John A. Stolp

Annual Members

Robert C. Becherer, Edward J. Bradley, W. A. Brown, Jr., Dr. Harley E. Cluxton, Jr., Boughton Cobb, Bruce Cumming, Bernard Echt, Henry K. Gardner, Donald F. Grace, Otto Greiner, Merrill A Grogel, F. H. Hammurabi, James C. Hemphill, Robert M. Lawton, Stanley W. Marion, Benjamin H. Marshall, George A. Ranney, Jr., Mrs. William H. Rentschler, Alfred M. Rogers, Donald D. Rogers, Gordon E. Sergant, Dr. Frederick Steigmann, Jules Urbain, Jr.

BOARD HONORS SCIENTIST, FOUR CONTRIBUTORS

In recognition of his eminent service to science, Professor H. O. Beyer of Manila was elected an Honorary Member of the Museum at the May 18th meeting of the Board of Trustees. This is an honor that has been accorded to only eight other persons in the history of the Museum. Professor Beyer has won international acclaim as the outstanding authority on the ethnology and archaeology of the Philippine Islands. He has been professor of anthropology at the University of the Philippines since 1923 and is noted for his conduct of the most complete archaeological survey ever made in the islands. He is recognized also as a foremost scholar in the archaeology and ethnology of other island-groups in the Pacific. At Manila he has one of the world's most extensive and significant collections in the field of Pacific island research.

To the roll of Contributors, the special membership class for persons whose gifts to the Museum of money or materials range from $1,000 to $100,000, the Trustees added the names of four Chicagoans, two of them posthumously. The new Contributors are: Dr. Alfred E. Emerson, a professor of zoology at the University of Chicago, in recognition of his gift of an important collection of termites for research; Sterling Morton, for a contribution of securities; the late Leopold E. Block, a former Trustee, for a bequest of securities; and the late J. Edward Maass, for a bequest of money.

Museum Auditor Leaves For Business Post

William A. Bender, Auditor of the Museum, resigned, effective May 15, to accept a position as business manager of Honey Bear Farm near Genoa City, Wisconsin, a few miles beyond the northern border of Illinois. A former dairy farm, it was converted in 1951 into a group of gift and specialty shops and a tearoom by Mrs. Julia Steven Kraft, well known as the operator of Mrs. Steven's candy shops. The farm is now visited by as many as 200,000 tourists and visitors in a year.

Mr. Bender joined the Museum staff in 1947 as Assistant Auditor and was promoted to Auditor the following year.

A. L. Stebbins Appointed

At its meeting on May 18, the Board of Trustees appointed A. L. Stebbins as Auditor to succeed Mr. Bender. Mr. Stebbins, who was Assistant Auditor, has been a member of the Museum's accounting staff since 1931. Before coming to this institution he had been employed by the Western Electric Company, Standard Oil Company, and Sears Roebuck and Company. He served for some years as a captain in the U. S. Army Reserve.

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BULLETIN
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Chicago Natural History Museum

THE SALAMANDER STORY
(See page 3)

Chicago Natural History Museum

FOUNDED BY MARSHALL FIELD, 1893

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Members are requested to inform the Museum promptly of changes of address.

HYBRIDIZATION IN BIRDS

BY AUSTIN L. RAND

CURATOR OF BIRDS

A new exhibit of birds in Boardman Conover Hall (Hall 21) illustrates hybridization, with examples and an account of the conditions under which hybrids occur.

The word *hybrid* is used here for the offspring of parents of different species. In general, bird hybrids are rare in nature. Hybrids tend to be more frequent between more closely related species, and the hybrids between more closely related species tend to be fertile more often than hybrids between more distantly related species. Hybrids occur most frequently in areas in which two species that are relatively young, geologically speaking, have recently met and overlapped. In certain groups such as the ducks and the gallinaceous birds hybrids tend to be frequent.

The yellow-shafted and the red-shafted flickers provide an example of the first category. Presumably before the latest glaciation of North America there was but one species of flicker across northern North America. With the advance of the glaciers, their ice and the desert conditions in front of them in the central part of the continent divided our northern forests into an eastern and a western one. The flickers, dependent on trees for their nesting, thus became divided into an eastern and a western population, each completely isolated from the other. In this isolation each population evolved different characters: the western bird a gray throat, red malar stripes (in the male), red shafts to the flight and tail feathers, red linings to wings and tail, but no red nuchal patch; the eastern bird a tan-colored throat, black malar stripes (in the male), yellow shafts to the quills, yellow linings to the wings and tail, and a red nuchal patch (in the male).

CHANGES SUPERFICIAL

Then the ice retreated. The forests moved north again, toward the center of the continent, where they met. With them moved their flicker populations. Finally the flickers met. Though in appearance the flickers now were quite different, biologically they had changed less. They had not yet developed a barrier to interbreeding.

Where their ranges overlapped they crossmated freely, and over considerable areas in the central west there are no pure-bred birds at all. Whole populations are composed of hybrids. These hybrids show a blending of characters that results in many of the birds being intermediate in type or with a mixture of the characters of the two species, as is shown by four selected examples in our exhibit.

Though the yellow-shafted and the red-shafted flickers are so different in appearance that most bird students call them species, to a biologist they still could be considered subspecies, interbreeding freely where they meet. It is possible that, if given time, the two forms could fuse completely into one again.

HYBRID WARBLERS COMMON

The golden-winged and the blue-winged warblers are another example. They are respectively northern and southern species in the forests of the eastern United States, but there is a broad overlap in their ranges. Presumably they resulted from populations isolated in the eastern part of the continent and later brought into contact. The appearance of the parents is very different, but hybrids are of common occurrence. These hybrids present a different picture from that of the hybrid flicker. The hybrid warblers tend to be of four types:

Type 1. Like parent golden-winged warbler with black head pattern, gray back, white underparts, and yellow in wing.

Type 2. Like parent blue-winged warbler, without black head pattern, with olive back, yellow underparts, and white and blue in wing.

Type 3. Similar to a golden-winged warbler, but without black head pattern and yellow on breast (this when first found was thought to be a new species and called Brewster's warbler).

Type 4. Similar to a blue-winged warbler, but with the black head pattern of a golden-winged warbler (this, too, when first found was thought to be a new species and called Lawrence's warbler).

The first generation hybrids appear to be of the Brewster warbler type. Later matings of hybrids produce the four types of hybrids given above, but not in equal number. The Lawrence warbler is much the rarest of the types, and genetic calculations have shown that this is probably because the Lawrence type is a double recessive for two characters. The frequency of occurrence in hybrids probably fits the frequencies of Brewster's 9 out of 16, golden-winged 3 out of 16, blue-winged 3 of 16, and Lawrence's 1 of 16.

The pheasants and their relatives are particularly well known for the frequency with which hybrids are produced. We have illustrated this with a hybrid golden–Lady Amherst pheasant of a kind commonly seen in aviaries as an ornamental. The black and white "cape" is that of the Lady Amherst, the red on the flanks is that of the golden, while crest and tail are intermediate, to mention the more obvious points.

In ducks, too, hybrids are known to occur with some frequency, and we have illustrated this with a cross or hybrid between a black duck and a mallard. Though such crosses occur in nature and may be fertile, they do not seem to persist, and presumably they are not so hardy as the parent stock.

This exhibit was planned in the Division of Birds and executed by Carl W. Cotton, Staff Taxidermist.

THIS MONTH'S COVER

Its love of a uniformly cool and moist environment makes the salamander admirably suited to life in damp caves. However, a great drawback is the scarcity of food there, and this is probably the reason that few true cave species exist. The mouths of caves, on the other hand, offer much better conditions for getting food and are frequented by many kinds of salamanders that live for the most part outside the caves. The true cave species are characterized chiefly by a lack of color and by blindness. The Ozark species shown does not represent the extreme adaptation to subterranean life but rather a condition intermediate between the true cave species and the usual woodland or aquatic salamander. Our cover picture is published by courtesy of Charles E. Mohr, of Greenwich, Connecticut, who is widely known as an outstanding photographer of cave life. An article on salamanders in general, by Clifford H. Pope, Curator of Amphibians and Reptiles, appears on page 3.

THE OBSCURE SALAMANDER DESERVES A PLACE IN THE SUN

By CLIFFORD H. POPE
CURATOR OF AMPHIBIANS AND REPTILES

I ONCE ASKED AN acquaintance what he did for a living. He answered that he did not like to say because his reply was too apt to bring a laugh. It turned out that he was a manufacturer of hot tamales and had a small but flourishing business. I sympathized with him because my interest in snakes has often brought a laugh, or at least a facetious remark.

SPOTTED SALAMANDER LAYING EGGS

Since taking up a study of salamanders I may be met with a blank expression rather than a laugh. This is even more trying because I know that a long explanation will be called for. Such an explanation often leaves the recipient's mind confused. He may even become defiant or skeptical.

Recently I tried to explain to my barber that he uses salamanders, not lizards, as bait in fishing for bass, but he chose to remain skeptical. After all, the little animals in question look like lizards to him and lizards they are and always will be. I changed the subject because I consider it highly imprudent to push an argument when in the barber's chair. It might be remarked here that this constant confusion of the salamander with the lizard is due basically to a similarity in shape. However, if the former were well known and the latter were not, the layman would insist on calling a lizard a kind of salamander.

UNFAMILIARITY BREEDS CONTEMPT!

My barber did not realize that he was putting salamanders to what is just about their only practical use, thus demonstrating in a way why salamanders must forever be more or less obscurely linked or confused in the lay mind with lizards, which most emphatically they are not. If my barber's friends insisted on confusing him with a gorilla, he no doubt would take offense, whereas his relationship to a gorilla is vastly closer than is the relationship of the lizard to the salamander.

The cause of the relative obscurity of salamanders is, I believe, their lack of usefulness. The other important vertebrates or backboned animals, mammals, birds, reptiles (including snakes, lizards, turtles, and crocodilians), and frogs are familiar to every man, woman, and child. It is true that one small group of amphibians, the caecilians, is virtually unknown, but the explanation of its obscurity is patent: caecilians are secretive burrowing creatures of the tropics so rare that many professional herpetologists live and die without ever laying eyes on a living one. Moreover, a caecilian looks rather like a snake and would mislead anyone.

As we think of the well-known groups of vertebrates it becomes apparent that they have certain qualities in common: all are abundant, all are widely distributed, and all have considerable economic value. The snakes and the lizards do not rank with some of the others in economic value, but the snakes make up for this deficiency in their peculiar emotional appeal to man, the lizards in sheer abundance and conspicuousness. The sun-loving habits of most lizards keep them in the open where they are quickly seen. In abundance and extent of distribution the salamanders hold their own well enough, although in number of species they are far surpassed by all the other important groups except the crocodilians (alligators and crocodiles) and the turtles.

NO CLAIMS EVEN TO NOTORIETY

The salamanders alone can boast of no real economic importance because, with few exceptions, they are too small to be eaten and their skins would not be large or thick enough to serve as leather. Nor do their feeding habits make them useful as destroyers of the enemies of man. Even if they were highly dangerous like the crocodiles, some of the larger mammals, and the venomous snakes, they would at least be notorious. But a poisonous skin harmful only to the digestive tract of man is too much of a negative characteristic to make the salamander notorious.

Do salamanders deserve this unimportance? Are they devoid of any significance or interest that would make them worthy of attention? The reply is an emphatic negative. When we trace our ancestry back toward the lower forms from which we arose we can by-pass even such highly popular groups as the birds, which are merely specialized reptiles, but we must go very near to the salamanders. These creatures lie close to the line of descent that links us to the fishes. It was an amphibian not unlike a modern salamander that first escaped the bondage of water and came out on land to live. Many of the salamanders of today reflect this stage of vertebrate evolution in their double life, part of which is spent on land and part in water. Every student of biology comes in contact with a salamander in the laboratory when studying the anatomy and evolution of vertebrates. Salamanders are not only sold by the thousands to schools and colleges for student dissection but are used extensively in biological laboratories as objects of experimentation. To the zoologist, then, the unknown salamander is at least as important as any other vertebrate, always, of course, excepting the mammals.

From the point of view of the naturalist the salamanders are extremely interesting because of their unusual habits and complex life-histories. The common newt, for example, has a three-stage development that begins in water (larval form), continues on land (red-eft stage), and is concluded in water (mature or reproductive stage). In some kinds of newts the males develop gaudy crests during the breeding season, a fact that European aquarium and terrarium lovers have taken advantage of to develop the hobby of rearing newts, which is like the tropical-fish hobby of this country. No such interest has ever been developed in the United States, although we have a vastly richer salamander fauna than does Europe. Perhaps the explanation lies in our lack of

Drawings by Margaret G. Bradbury

HOW TO TELL A SALAMANDER FROM A LIZARD

The heavy-bodied scaleless salamander known as the hellbender is shown above at left. Below it is a "typical salamander." A lizard, distinguished by its scales, is seen on the right.

really spectacular kinds that would stimulate such a hobby. Some Japanese newts are sold in our stores and do eventually find their way into home aquariums or terrariums.

The courtship of many salamanders is interesting to watch and the method of fertilization unique among the backboned animals. The eggs of the primitive kinds are laid in water, those of the more advanced on land. They are often guarded by the mother, a fact proving that the lowly salamander is not entirely devoid of concern for the coming generation. The process of reproduction is in general intermediate between that of the fishes and that of the vertebrates higher than the salamanders.

LINKED WITH RAIN AND FIRE

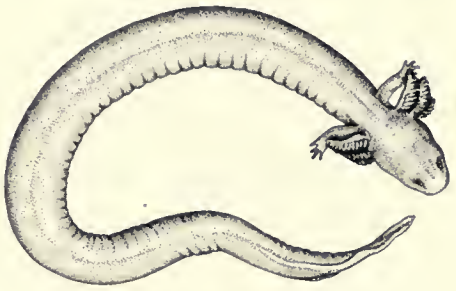
Although, as already pointed out, salamanders are relatively few in total number of species, they not only are widely distributed but also are found throughout the northern hemisphere where advanced human cultures have long been interested in studying life scientifically. Few salamanders are found in Africa and South America and none occurs in Australia. In the Old World the significance of these animals varies from place to place. In China salamanders are associated with rain and even believed to control it. This is not so surprising in view of the fact that these amphibians are moisture-loving. While working in China I was advised to refrain from catching salamanders during dry spells, and I learned that they are often kept in temples and carefully protected there.

In Europe the salamander is associated with fire, and the belief that salamanders actually live in fire is reflected in many languages. Incinerators, portable stoves, and other articles used in connection with fire are known as "salamanders." An example of this is a type of utensil for browning pastry. The theory of Paracelsus, the Swiss physician and alchemist of the 16th century, gives some idea of the age of this association with fire. This savant held that the salamander was a being actually inhabiting fire. Considering the inability of salamanders to withstand even the heat of ordinary sunlight, this is a remarkable myth. Perhaps the frequent appearance of salamanders on hearths gave rise to it—individual salamanders brought in with firewood would crawl out on feeling the drying effect of the heat and seem to have emerged from the ashes.

Finally, salamanders are varied enough in size and shape to attract attention. The giant salamanders of Japan and China reach a length of from three to five feet and have grotesque flat bodies. In the United States the hellbenders, though considerably smaller than their Asiatic cousins, the giant salamanders, are formidable in appearance. Once while I was hunting in North Carolina a fisherman friend of mine caught a hellbender and ran a mile with it to ask what it could be. He seemed to be convinced that he had discovered the devil itself. This and the name "hellbender" give ample evidence of grotesqueness.

SIREN IN CHICAGO AREA

The "Congo eels" and sirens of the southeastern lowlands are shaped like eels and reach a length of three feet. One kind of siren actually occurs in the Chicago area where it is so rare that few persons ever see



A VOICELESS SIREN

This salamander's only link with mythological sirens, for which it is named, is its aquatic habitat. It breathes by means of gills, which grow just in front of its tiny legs. The hind legs of the species have been lost in the course of evolution. This kind of siren is occasionally found in the Chicago area.

it. The smallest species of salamanders are barely three inches long and not nearly so thick as a lead pencil. These large and small extremes are the exceptions proving the rule that the typical salamander is a lizard-shaped vertebrate about five inches long. It should be remembered that the smooth, moist skin of the salamander is in sharp contrast to the dry, scaly skin of the lizard, and consequently the two can be distinguished at once even by the untrained eye.

In the year 1943 the salamanders of this country attained the stature of having a complete 555-page book of a semitechnical nature devoted to them: *Handbook of Salamanders* by the late Sherman C. Bishop, who was our leading student of the group. The addition of Dr. Bishop's superb study collection to that of Chicago Natural History Museum put this Museum in possession of the finest research collection of salamanders to be found anywhere.

2,200 INSECTS IN AMBER ACQUIRED BY MUSEUM

Important collections of insects in amber are rare, and most of those on record have found their way into European museums where they have been held for years and, for the most part, probably will remain. So far as known by staff members of the Department of Zoology at Chicago Natural History Museum, the only two important collections in the United States are one obtained in the 1930's by the Museum of Comparative Zoology at Harvard University and a collection of 2,200 specimens recently acquired by this Museum. The world's finest collection, consisting of more than 100,000 specimens owned by the Königsberg Museum in Germany, was destroyed during World War II.

The collection just obtained for our Museum consists of insects that were trapped in the flowing pitch of conifers that grew about 30 to 35 million years ago in an area now submerged by the Baltic Sea. This is the A. F. Kohlman collection, obtained from F. E. Trinklein, a high-school science teacher of Racine, Wisconsin, who purchased it at an auction following Mr. Kohlman's death several years ago. In the millions of years during which the resin-enclosed insects lay beneath the sea they fossilized. They thus have been preserved accidentally in much the same fashion that modern specimens are purposely preserved in balsam-resin slides for microscopic study. In fact, of this collection about 1,450 of the specimens have been prepared for research with a microscope. The collection was assembled in the period from 1900 to 1915. They are specimens "naturally embedded in plastic." The state of preservation is unique. Most of them can be studied in such minute detail that it is possible to compare carefully and relate them to modern forms, says Rupert L. Wenzel, Curator of Insects.

"Study of the rich Baltic amber fauna has probably enabled workers to learn more about the insects of the area and time than is true of any other group of animals for any geologic horizon," Curator Wenzel adds. "The material is of particular importance because it gives the first clear picture of an ancient insect fauna since Carboniferous and Permian times. The intervening Mesozoic period, marked in the evolutionary picture by the rise and fall of dinosaurs and the beginning of the mammals, has yielded relatively few fossil insects. Baltic amber has been a valuable article of commerce for more than 2,000 years both as a semiprecious mineral and as a source of amber varnish. The sources of Baltic amber were much depleted by mining and dredging operations before World War II, and those that remain are now in Russian hands."

Scandinavian Paleontologist Studies Here

Dr. Tor Orvig, a paleontologist from the Swedish Natural History Museum in Stockholm, spent two weeks in Chicago recently, during which he studied the collection of fossil fishes at this Museum. He was particularly interested in those of Silurian and Devonian age.

He who sees things grow from the beginning will have the best view of them.

—Aristotle

Members to Get Annual Report

Chicago Natural History Museum Press has just published the Annual Report of Colonel Clifford C. Gregg, Director of the Museum, to the Board of Trustees. A detailed account of the principal activities of the Museum during 1952 will be found in its 138 pages, accompanied by 22 illustrations. All members of the Museum will receive copies at an early date.

LECTURE TOUR SCHEDULE DOUBLED IN SUMMER

Tours of Museum exhibits will be conducted twice a day, mornings and afternoons, during July and August (Monday through Friday). Each morning tour, except Thursday, is a general survey of one department of the Museum. The afternoon tours (and Thursday morning) are general surveys of the highlights of the exhibits. Following is the schedule:

Mondays: 11 A.M.—People and Places
2 P.M.—Highlights of the Exhibits

Tuesdays: 11 A.M.—The Story of Plants
2 P.M.—Highlights of the Exhibits

Wednesdays: 11 A.M.—The Earth's Story
2 P.M.—Highlights of the Exhibits

Thursdays: 11 A.M. and 2 P.M.—Highlights of the Exhibits

Fridays: 11 A.M.—The World of Animals
2 P.M.—Highlights of the Exhibits

Groups of ten or more who would like special tours on subjects within the range of Museum exhibits must file a request for this service with the Director of the Museum. Such requests should be made at least one week in advance.

No tours are conducted on Saturdays and Sundays, but the Museum will be open to visitors on those days during the usual hours, 9 A.M. to 6 P.M.

Children Urged to Visit Museum During Summer Vacation

Cave men of 50,000 to 250,000 years ago, animals from all over the world including many that cannot be seen in any zoos as well as their prehistoric relatives that lived hundreds of millions of years ago, and plants from all over the world including many that cannot be grown here even in conservatories—all these await hundreds of thousands of children at the Museum during the long vacation from school. Youngsters and their parents are urged to make full use of the Museum's facilities during the summer. Admission for children is free every day, and visiting hours are 9 A.M. to 6 P.M.

"Children will be delighted with the fun of a Museum visit and scarcely aware that they are still being educated, though actually they will be learning as much as if they were at school," Colonel Clifford C. Gregg, Director, said. "Children find the Museum as exciting as any of the forms of entertainment, and yet they can't help but absorb valuable information. It's a pleasant continuance of education and most effective."

Beginning July 9 and continuing through August 13 there will be free movies for children in the James Simpson Theatre (see page 7 for program).

Colombian Crocodiles Studied

Dr. Frederick J. Medem, Professor *ad honorem* of the Instituto de Ciencias Naturales, Universidad Nacional, Bogotá, Colombia, is spending several months in the Division of Amphibians and Reptiles where he is making a taxonomic study of the crocodilians of Colombia. Dr. Medem holds a Guggenheim Fellowship for the year 1953–54. For about two years he collected and studied Colombian crocodiles and caimans.

LIFE OF POMO INDIANS IN CALIFORNIA SHOWN

Days when angleworm soup and acorns were prime delicacies for the gourmets of California are recalled in a series of new exhibits added to the Hall of Indian Tribes of the Western Plains and California (Hall 6). The new series, which is devoted to the Pomo tribe of central California, brings the newest hall in the Museum to completion.

Each exhibit of the display is devoted to a different facet of Pomo culture. An interesting exhibit is a miniature diorama of a group of men and women collecting acorns fallen to the ground from a giant oak tree. The numerous implements that the Pomo used to gather acorns and make them into a home-cooked treat are displayed in two exhibits of food-collecting and household equipment. Also displayed is a special worm digger that the Pomo fashioned from a pole. With this a man would set out in the hope of getting enough worms to prepare another culinary favorite—angleworm soup.

An equivalent of "seven-come-eleven" was a popular diversion among the Pomo, and a pair of wooden dice used in this pastime is exhibited in the section devoted to games. Other games represented include pole and hoop, ring and pin, shinny, and guessing games. Intricate jewelry and ingenious musical instruments are shown in the arts and music section. The more practical pursuits of life are represented by exhibits devoted to objects used in healing the sick and weapons used for warfare and hunting. One exhibit even gives an idea of what might appear in a Pomo "bargain sale."

The new exhibits were created by Gustaf Dalstrom, Artist, Alfred Lee Rowell, Dioramist, and Walter C. Reese, Preparator, under the supervision of George I. Quimby, Curator of Exhibits, Department of Anthropology. One section of the hall that was opened last year contains exhibits representing Indians of the Plains. A second section is devoted to the intermountain tribes that were influenced in many ways by the Plains Indian peoples.

POMO INDIANS GATHERING ACORNS, THEIR 'STAFF OF LIFE'

New diorama in Hall of the Indian Tribes of the West (Hall 6). By various processes these California natives reduced to flour the extra-large acorns found in their homeland.

A SPECIAL EXHIBIT OF LIFE AND ART OF NIGERIA

A special exhibit of 50 salon prints by Dr. Justine Cordwell, Chicago anthropologist, will offer an opportunity to see the people and the art of southern Nigeria. The exhibit will be in Stanley Field Hall throughout July. Dr. Cordwell took the exhibition photographs while on a fourteen-month field trip to West Africa. Her primary purpose was to test the validity of many currently accepted ideas concerning primitive art.

Justine Cordwell

Although a great deal has been written on the subject of primitive art, most of the material is based on studies that have neglected the cultural context in which the art forms were created and meaningful understanding of this complex culture and the art forms that have grown out of it. She is able to communicate a part of this understanding by means of her salon prints.

The exhibit of prints marks the completion of a cycle of activity that Dr. Cordwell began as a student at the Art Institute of Chicago, where she first became interested in primitive art. During her early student days she frequented the Museum to get her first real look at the art forms of primitive peoples. She followed up this interest by continuing her education at Northwestern University, where she received her Ph.D. in anthropology in 1952. It was while on her predoctoral field trip, for which she was given a Rockefeller Foundation Fellowship, that Dr. Cordwell took the photographs that now are on exhibition.

In addition to the pictures, the special exhibit will include representative textiles and other artifacts, some collected by Dr. Cordwell and some from the Museum's own collection.

PRIESTESS AT SHRINE OF RIVER GODDESS

At left are carved human figures on part of a tree trunk; in foreground are symbolic utensils and a carved human head. The scene is in a tribal palace at Oshogbo, Nigeria. The ancient goddess of the shrine, known as Oshun, is still worshiped in the Western Hemisphere, as well as Africa, by descendants of her followers brought years ago to Cuba, Trinidad and Brazil. This is one of 50 pictures in the specialAfrican exhibit at the Museum during July.

Not chaos-like together crushed and bruised,
But, as the world, harmoniously confused;
Where order in variety we see,
And where, tho' all things differ, all agree.

—POPE

Distinguished Visitors from Italy

Dr. Bruno Molajoli, Director of Fine Arts for the District of Campania, Italy, with headquarters in Naples, and Mrs. Molajoli, were recent visitors at Chicago Natural History Museum. They spent an entire day in surveying the exhibits and in conferences with members of the staff.

Gifts to the Museum

Following is a list of the principal gifts received during the past month:

Department of Botany:

From: Dr. Carleton R. Ball, Washington, D.C.—10 miscellaneous phanerogams, United States and Canada; Dr. Delzie Demaree, Bauxite, Ark.—94 miscellaneous phanerogams, midwestern United States; Dr. J. Soukup, Lima, Peru—9 phanerogams, Peru; Archie F. Wilson, Flossmoor, Ill.—11 miscellaneous phanerogams, Texas

Department of Geology:

From: Robert Smolker, Chicago—*Acanthotelson stimpsoni*, Illinois; William D. Turnbull and Priscilla F. Turnbull, Park Forest, Ill.—insect wing and complete skeleton of a microsaur, Illinois; Dan Kreuzer, Chicago—*Rafinesquina alternata* and *Zygospira modesta*, Cincinnati; O. G. Alessio, Chicago—3 specimens of rutile, Pluma Hidalgo, Oaxaca, Mexico; Crane Company, Chicago—titanium button, 2 titanium sponge specimens

Department of Zoology:

From: Joseph H. Shirk, Peru, Ind.—6 mammal skulls, Arizona and New Mexico; Dr. Harold Trapido, Panama City, Panama—25 salamanders, 56 frogs, and snake, Panama, Corsica, and Sardinia; Pacific Science Board, Honolulu, Hawaii—264 fulgorid bugs, Micronesia; Dr. Henry Field, Washington, D.C.—20 water snakes, Florida; Dr. Walter C. Brown, Palo Alto, Calif.—73 salamanders, 12 frogs, 2 snakes, western United States; Robert G. Buswell, joint donor with Clark G. Buswell, Los Angeles, Calif.—collection of shells, world-wide; Chicago Zoological Society, Brookfield, Ill.—green jungle-fowl skin; T. Durval de Lucenta, Pernambuco, Brazil—collections of freshwater shells, Brazil; C. Deuquet, Oatley, New South Wales, Australia—funnel-web spider, 3 buprestid beetles, Australia; Marshall Laird, Suva, Fiji Islands—84 lizards, 3 snakes, Cook Islands, New Hebrides, and Fiji Islands; Joe T. Marshall, Tucson, Ariz.—2 lizards, Marshall Islands; Joseph Moore Museum, Richmond, Ind.—bird skin, Indiana; Dr. Charles H. Seevers, Homewood, Ill.—2 staphylinid beetles (holotypes), Philippine Islands; John G. Shedd Aquarium, Chicago—38 lots of fishes, Bahamas; Dr. Helmut Sick, Rio de Janeiro, Brazil—collection of shells, Brazil; Dr. Harald Sioli, Bélem, Pará, Brazil—collection of freshwater shells, Amazon region; Dr. Karel Sperber, Chicago—collection of sea shells, Seychelles Islands; U. S. Public Health Service, Chamblee, Ga.—4 flies (paratypes), Maryland and Georgia; A. Wolffsohn, British Honduras—turtle, 7 lizards, 2 snakes, British Honduras

'SYMPATHETIC MAGIC' TO AID THE CROPS

A scheme to produce tears for the dead, as the first step in a roundabout process for inducing rain to fall and aid the crops, is attributed to figures painted on pottery funerary urns in which an ancient people buried their dead in northwestern Argentina. It exemplifies a device of a type that occurs in many cultures and that anthropologists call "sympathetic magic." Examples of such urns are on exhibition in Hall 9.

The people who made these urns disappeared before the Spanish invasion of South America. Little is known of them other than that the few vestiges of their culture indicate they achieved a level less elaborate than that of the Incas, who later conquered northwestern Argentina. Archaeologists have designated the culture by the name Calchaqui, after the name of the valley in which this tribe flourished.

On many of the urns tears are shown falling from the eyes of figures of people painted upon them. This may be evidence of an attempt at "sympathetic magic." It has been suggested that the Calchaqui idea was that if living people could be persuaded by these paintings to weep for the dead, or if even the painted faces themselves were depicted as streaming with tears, a principle of like producing like would be invoked—that is, the fertility gods would also weep, and their tears in the form of rain would descend upon the earth and stimulate crops.

The pottery urns are skillfully and artistically made, and the designs and pictures painted upon them are imaginatively conceived. It is believed that before burying the dead in these urns, the bodies were first exposed in branches of trees or on rocks until the flesh decomposed. The bones were then gathered and deposited in the urns.

As a rule adults were interred in the ground or in caves, and the urns were used principally for children. Whole cemeteries have been discovered containing the remains of children only, and it has been suggested that the young may have been sacrifices to the gods of fertility and rain.

U. S. Army Entomologist Becomes Museum Research Associate

Lieutenant Colonel Robert Traub, of the United States Army Medical Service Corps, was elected a Research Associate in the Museum's Division of Insects at the meeting on June 15 of the Board of Trustees.

Colonel Traub is an outstanding authority on the classification of fleas. He has published many papers on the subject, including a volume in this Museum's Memoir Series of Fieldiana, and has spent much time in preparation and study of the Museum's flea collections.

During most of World War II Colonel Traub served in the Burma-Ledo Road area as a member of the U. S. Army Typhus Commission. Since the war he has been chief of the entomology and parasitology department of the Army Medical Graduate School, Walter Reed Army Medical Center, Washington, D.C. In this capacity he has been frequently dispatched on missions to the Far East and was sent to Korea to investigate Manchurian fever, a disease that the Army was accused of spreading among the enemy.

STAFF NOTES

Dr. Theodor Just, Chief Curator of Botany, recently lectured before the Zoology Club of the University of Chicago. His subject was "Paleobotany and Evolution." . . . **Miss Elaine Bluhm,** Assistant in Archaeology, recently lectured on archaeology as a career before the students' career council at Carl Schurz High School, Chicago . . . **Colin Campbell Sanborn,** Curator of Mammals, visited the U. S. National Museum in Washington, D.C., to examine certain collections recently, and attended the annual meeting of the American Society of Mammalogists at the American Museum of Natural History in New York. He was elected one of the Directors of the society and named chairman of the nomenclature committee.

NEW MEMBERS

The following persons became Museum Members from May 18 to June 15:

Honorary Member

Professor H. O. Beyer

Contributors

Leopold E. Block,* Dr. Alfred E. Emerson, J. Edward Maass,* Sterling Morton

Associate Members

J. C. Bowman, Dr. Sam S. Chrisos, Mrs. S. L. Ingersoll, J. Morris Jones, Miss Clara R. Lacey, George E. Phoenix

Annual Members

Charles E. Bobus, H. G. Clarke, Carl A. Dahlin, Harold V. Engh, Dr. Vincent C. Freda, James J. Gregory, Ralph A. Hanna, Arthur S. Hindman, Martin L. Jack, Raymond Kropp, H. Dale Long, Eugene R. McPheron, P. B. Montgomery, S. A. Montgomery, Joseph M. Mozeris, Max W. Petacque, Dr. Albert G. Peters, Mrs. C. Eugene Pfister, Mrs. A. J. Pikiel, Dr. Noah H. Sloan, Dean C. Smith, Milton J. Spitz, Charles C. Vance, Amos H. Watts, Rollin D. Wood, Mrs. W. R. Zitzewitz

* Deceased

Primitive "tooth brushes" of West African natives are shown in Hall D. They are short sticks—light colored for women, dark for men. The ends are chewed until they become fibrous, after which they are used vigorously on the teeth.

SUMMER MOVIE SERIES FREE TO CHILDREN

A chance for some summer fun and learning is here again. The series of free movies for children given by the Raymond Foundation will begin on July 9 and continue for six consecutive Thursday mornings through August 13. Two performances of each program will be given, one at 10 A.M. and one at 11 A.M., in the James Simpson Theatre of the Museum. The Theatre and west entrance of the Museum will be open at 9:30 A.M. Dates and titles of the shows are:

July 9—WATER BIRDS
A Disney color-film
Also a cartoon

July 16—ELEPHANT BOY*
Kipling's great story with Sabu, the elephant boy

July 23—POCAHONTAS
The story of the Indian girl who saved the settlers at Jamestown
Also a cartoon

July 30—NATURE'S HALF ACRE
A Disney color-film showing nature's pageant in all seasons
Also a cartoon

August 6—ANIMAL STORIES
"Black Patch" and "Boy and the Eagle"
Also a cartoon

August 13—ZANZABELLE IN PARIS
A puppet-story of a giraffe in Paris and other puppet stories
Also a cartoon

*This film is longer and so the 2nd show will begin at about 11:20 A.M.

Although the above programs are selected for children, adults are welcome to attend, but adults not accompanying children are requested to give their seats to children if the Theatre is crowded. Leaders of children's groups are requested to remain with their groups and maintain order during the entire program. Large groups should arrive before the program starts in order to have all the children seated together.

Icelandic Scientist a Visitor

Dr. Finnur Gudmundsson, well-known marine biologist and director of the Museum of Natural History in Reykjavik, Iceland, was a recent visitor at Chicago Natural History Museum. He conferred with members of the staff of the Departments of Botany and Zoology.

Keep cool at the Museum. When Chicago recently sizzled in 104-degree temperature, the exhibition halls were a comfortable 76.

Books

(All books reviewed in the BULLETIN *are available in The Book Shop of the Museum. Mail orders accompanied by remittance including postage are promptly filled.)*

PHYSIOLOGY OF THE FUNGI. By Virgil Greene Lilly and Horace L. Barnett. McGraw-Hill Book Company, New York, xii+464 pages, frontispiece and 81 illustrations. Price $7.50.

Although the fungi (molds, mushrooms, toadstools) are neither the most conspicuous nor the most beautiful organisms known, they are easily among the most interesting living beings. By their almost universal presence in a great variety of habitats and their complex activities they play the crucial ecological role of maintaining the balance of nature. They accomplish this by disposing of dead and fallen vegetation, freeing thereby the biologically essential elements contained in these plant bodies either for their own use or the benefit of other organisms. Beyond this vital participation in the organic cycle, fungi may cause important diseases in plants (and other organisms), often resulting in great financial losses. On the other hand, fungi have been used ever since the beginning of agriculture and are still being used for preparing bread and other foods. Finally fungi are widely used in industry, particularly since the discovery of antibiotics.

Considerable information concerning fungi and their varied activities has been accumulated through extensive research, but unfortunately this is deposited in widely scattered publications. By summarizing critically the results and observations obtained, the authors of this book have rendered a great service to those engaged in this active field of biological research. They have also provided an excellent reference work for others seeking information regarding the life processes of fungi.

The timeliness of this book is best indicated by citing some of the topics treated, such as vitamins and growth factors, the action of fungicides, fat production, antibiotics and drugs, and physiological variation. Suitable laboratory exercises are suggested for the demonstration of the principles and phenomena discussed in the main part of the book.

Naturalists will find material of interest to them under such headings as toxins, pigments, fungi as food, spore dissemination, and parasitism and symbiosis with insects, but will look in vain for certain entries in the index, namely mycorhiza (the relationship of certain fungi with the root systems of higher plants) and lichenization (the intricate process by which algae and fungi join in the formation of lichens). Nevertheless all readers of this informative book will agree with its authors that "an understanding of life processes of the fungi is essential whether one wishes to control the fungi which cause disease, to employ them in industry, or to use them in the laboratory to unlock the secrets of nature."

THEODOR JUST
Chief Curator of Botany

PRIZE-WINNING JEWELRY IN LAPIDARY CONTEST

As in previous years, the special exhibit of prize-winning gems and jewelry by amateur lapidarists, held in Stanley Field Hall of the Museum during June, attracted much interest. This year's event was the Third Annual Amateur Handcrafted Gem and Jewelry Competitive Exhibition sponsored by the Chicago Lapidary Club, whose members, together with those of affiliated organizations, are known as "rock hounds." Several innovations in types of material exhibited were made this year.

In the accompanying illustration some of the "best in show" and other prize-winning pieces are shown by two Patricia Stevens models—Miss Carmelita Gibbs (left) and Miss Mary Johnson, who were present for the press preview at the Museum. Visitors who missed the exhibit at the Museum may still see it at C. D. Peacock, jewelers.

Technical Publications

The following technical publications were issued recently by Chicago Natural History Museum:

Fieldiana: Zoology, Vol. 34, No. 10. *Notes on Flycatchers of Genus Batis.* By Austin L. Rand. April 27, 1953. 16 pages. $ .35

Fieldiana: Zoology, Vol. 33, No. 3. *Notes on Philippine Mosquitoes, XIII. Four New Species of Zeugnomyia and Topomyia.* By Francisco E. Baisas and Pablo Feliciano. May 13, 1953. 21 pages. $ .50

Dr. Schmidt Going to Europe

Dr. Karl P. Schmidt, Chief Curator of Zoology, will be the delegate of the Museum at the 14th International Congress of Zoology in Copenhagen, August 5 to 12. Dr. Schmidt will sail from New York on July 25. After attending the Congress he will visit various European museums and study especially at the British Museum (Natural History) in London. He hopes to make a brief collecting-trip to Israel, at the invitation of his colleague, Dr. Georg Haas, of the Hebrew University of Jerusalem. Dr. Schmidt and Dr. Haas have long collaborated in studies of reptiles of southwestern Asia. Dr. Schmidt plans to return to the Museum early in October.

In Hall D a large shield of light texture, made from ambatch wood and unique in type, illustrates how the Buduma tribesmen of the Lake Chad region defend themselves from the jabs of long spears.

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BULLETIN
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Chicago Natural History Museum

Australasian Native Arts
Special Exhibit
August 8—September 28

Chicago Natural History Museum

FOUNDED BY MARSHALL FIELD, 1893

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Members are requested to inform the Museum promptly of changes of address.

BIRD MEMO FROM MEXICO

A letter has just been received from Emmet R. Blake, Associate Curator of Birds, who, having finished his *Birds of Mexico, A Guide for Field Identification*, is spending some months conducting further studies on the birds of Mexico.

He writes from Mitla, Oaxaca, a thousand-year-old Indian village that was the seat of the Zapotec empire which fell to the Aztecs a few years before the Spanish Conquest. His room is in a 250-year-old hacienda. Mitla is a typical, sleepy Mexican village where one would think nothing ever happens. Yet, the day before Mr. Blake wrote his letter there was one of the first rains of the year, a fiesta, a funeral, a cold-blooded murder, and a wake for the victim that was sensational by American standards.

During May, Mr. Blake traveled extensively on the Plateau and also in the Caribbean lowlands—Matamoros, Tampico, Tuxpan, Tecolutla, and Nautla. The changes in vegetation, bird life, and other natural features that occur with altitude and latitude variations are most striking. The entire northern part of the country is clearly a continuation of our own Southwest, but from Tampico southward there are remarkable changes that need to be seen to be understood.

"My routine all along has been to have several hours of birding around camp each morning, take to the road at about 10 A.M., spot-check the bird life at intervals along the highway, and make camp as far from villages as possible at 4 to 5 P.M., for a final two hours of birding before supper and to bed," writes Blake. "Usually cook breakfast and supper, but stop at village or rural cafes for lunch. Occasionally have stopped a day or two in a city or town. In this manner it is possible to travel extensively and still see a great deal of country and its birds.

"The last two weeks were spent in the Isthmus of Tehuantepec, which I tried to cross but gave up at midpoint after several days' rugged experience. It is now the height of the rainy season and that makes it difficult.

"My plans include trips to some of the Boreal 'islands' on the higher mountains in the near future.

"I now have a fairly good picture of the country as a whole, the distribution of its bird life at first hand, and definite ideas about what remains to be done—and how. It is clear that regional lists of birds, based on collected specimens, will be needed for many years yet. Distribution, ecological relationships, migration, life histories, and many other aspects of Mexican birds are very far from being properly known. There is certainly room for lots of work yet, including some Museum expeditions.

"I have seen 12 copies of my book, *Birds of Mexico*, actually in the hands of people studying birds in the field. All seemed well pleased with it and naturally I am delighted at this favorable response."

TWO MORE FREE MOVIES AWAIT CHILDREN

The last two free movie programs in the summer series for children presented by the Raymond Foundation will be given on the first and second Thursday mornings in August. There will be two performances of each program, one at 10 A.M. and one at 11 A.M., in the James Simpson Theatre of the Museum. The Theatre and west entrance of the Museum will be open at 9:30 A.M. Dates and titles of the shows are:

August 6—ANIMAL STORIES

"Black Patch" and "Boy and the Eagle"

Also a cartoon

August 13—ZANZABELLE IN PARIS

A puppet-story of a giraffe in Paris and other puppet stories

Also a cartoon

Although the above programs are selected for children, adults are welcome to attend, but adults not accompanying children are requested to give their seats to children if the Theatre is crowded. Leaders of children's groups are requested to remain with their groups and maintain order.

THIS MONTH'S COVER

Even to so purely utilitarian a structure as a small storehouse the highly advanced Polynesians apply their skill in the art of decorative wood carving, as is shown by the example pictured on the cover of this Bulletin. This small building, called a pataka by the Maori tribesmen who erected it in New Zealand, is on stilts to keep the interior and its contents dry. The illustration is one of a series of photographs and objects to be shown in a special exhibit, "Australasian Native Arts," in Stanley Field Hall of the Museum from August 8 to September 28 (see page 3). The exhibit is composed principally of photographs made by Cyrus Townsend Brady, Jr., of Omaha, supplemented with art objects both from his and the Museum's collections.

New Assistant Appointed In Public Relations

Mrs. Alexander (Barbara) Polikoff has been appointed to the Museum staff as Assistant in Public Relations. A graduate (B.A.) of the University of Michigan, Mrs. Polikoff earned a Master of Arts degree in English literature at the University of Chicago. Before coming to the Museum she worked in the offices of the United States Army Engineers, taught English at Von Steuben High School in Chicago, and was an editor for the Industrial Relations Center at the University of Chicago. She will work with H. B. Harte, Public Relations Counsel in all phases of newspaper, magazine, radio and television publicity, and in editing the Museum BULLETIN.

Barbara Polikoff

Miss Christine Tardy, Associate Public Relations Counsel, employed at the Museum since the latter part of 1951, has resigned to enter another field of publicity activity. She will retain association with the Museum, in volunteer status, to continue a television project.

Three bronze sculptures in the south end of Stanley Field Hall, which illustrate the remarkable ritualized lion-hunting with spears characteristic of certain African tribes, are the work of the late Carl E. Akeley.

ARTS OF NEW ZEALAND, AUSTRALIA SHOWN

"AUSTRALASIAN NATIVE ARTS" is the next special exhibit scheduled for visitors at Chicago Natural History Museum. It will be on view from August 8 to September 28 inclusive, in Stanley Field Hall.

The display is in two sections. Part I, devoted to New Zealand, affords an opportunity to inspect the traditional art forms of the Maori people—forms which in recent years have largely vanished or changed as the people have succumbed to the absorptive processes of Western influence. Part II, dealing with the aboriginal tribes of Australia, offers an example of a living people whose culture remains on what we consider an ultra-primitive level. It presents art forms in which we can find something equivalent to the beginnings of art among our own early ancestors.

PHOTOGRAPHS AND OBJECTS

A major part of the exhibit will be a collection of about fifty large photographs made by Cyrus Townsend Brady, Jr., of New York City, a retired civil engineer and businessman who spent five years in the countries "down under." Mr. Brady will also show his collection of wood carvings, paintings and other original art objects produced by the natives of New Zealand and Australia. This material will be augmented by other objects from the Museum's own collections. Visitors are urged, after inspection of the special exhibit, to make a tour of the Museum's permanent exhibits from these lands (Hall A–I and Hall F on the ground floor). The New Zealand exhibit in Hall F is particularly notable for its inclusion of a complete large Maori council house erected just as it originally stood in New Zealand. Only six such houses are known to remain in existence.

POLYNESIAN CULTURAL APEX

When New Zealand was first visited by Europeans, the Maoris had brought Polynesian culture to one of its summits. They are the largest branch of the Polynesian race, and have in great measure assimilated Western civilization. They are now playing a proportionate role in the activities of their country. They number today about 100,000 in a total population of approximately 2,000,000.

However, under the changed conditions of their new life, their traditional art forms have been abandoned or altered, and are preserved only as relics or in museums. Articles manufactured to serve as souvenirs for tourists hardly count. The Maori art forms have not especially stimulated artists of European origin. Yet, though they may appear grotesque to unaccustomed Western eyes, they were so highly developed technically as to excite the admiration of art critics everywhere.

In Australia the aborigines were at the opposite pole of primitiveness from the Maoris, and the gap between their culture and that of the Europeans has proved very difficult to bridge. Most of the 50,000 who remain upon the mainland are now protected in reservations, while from the island of Tasmania they vanished generations ago.

The art forms of these aborigines are childlike in quality, but they are still alive and practiced widely, although with diminishing fervor and frequency. Yet their primitive quality and the eclectic aesthetic

MAORI MEMORIAL

This wooden figure carved by tribesmen of New Zealand is a departed chieftain named Pukaki. It antedates the arrival of Europeans in the country, and is now preserved in the Auckland Museum.

temper of our times have inspired painters, sculptors, composers and industrial designers among the 8,500,000 white Australians, who perceive in these forms something like the beginning of our own arts. There has resulted, among other developments, a school of aboriginal water-colorists who are now producing in a semi-European manner that offers high promise. Some of the work of the latter is included in the present exhibit.

Mr. Brady's exhibit was recently shown in the American Museum of Natural History in New York. After the Chicago showing, it is scheduled to go to the University of Philadelphia and the Peabody Museum of Salem, Massachusetts. Mr. Brady was a railroad-bridge engineer in Chicago during the early days of his engineering career.

Highly polished armlets of green soapstone, made by rubbing away the center of a stone disk with sand and water, are displayed in Hall E with other personal ornaments of the Tuareg of the Sahara.

MUSEUM MEN TO HUNT FOSSILS IN WYOMING

During August, a paleontological expedition will visit a mountainous section of northwestern Wyoming to collect Devonian fossil vertebrates for the Museum. Orville Gilpin, Chief Preparator of Fossils, will be in charge. He will be accompanied by William D. Turnbull, Preparator. They will work at Beartooth Butte, a familiar landmark to those who have approached Yellowstone Park via the spectacular Red Lodge–Cooke City highway.

Most of this part of Wyoming is formed of very ancient metamorphic and igneous rocks, while the butte itself is an isolated remnant of a mantle of younger Paleozoic sediments that must have covered much of the present Rocky Mountain region at one time. The vertebrates occur high in Beartooth Butte in a thin deposit of shales and limestone that is lens-shaped in section. Because of its red color, it is conspicuous even at a distance among the grayish limestones that form the rest of the butte. It was probably deposited in the estuary at the mouth of an ancient river, about 300 million years ago.

Because of the inaccessibility of the outcrop of the red shales and limestones, most of the collecting is done in the fallen rock that accumulates in a talus slope below. Remains of vertebrates are not uncommon here, and occur in considerable variety. Many belong to the early armored, jawless vertebrate stock, known as ostracoderms. Another group important in Devonian faunas, the arthrodires, have jaws and many other basic structural similarities to living fishes, although with their heavy skeletal armor they show little obvious resemblance to the fishes we know. Only a few fragments have been discovered that can be referred to groups still extant. They belong to lobe-finned fishes, and are related to the ancestors of the living coelacanths that have been discovered recently on the African coast.

ROBERT H. DENISON
Curator of Fossil Fishes

NATURE COURSE PROVIDED FOR GIRL SCOUTS

Mondays this summer are Girl Scout Days in the Museum. A course of instruction in subjects which will aid the young members of Girl Scout troops in gaining nature proficiency badges was begun on July 6 and will continue through August 31. The Museum's co-operation in this study is made available through the services of the lecture staff of the James Nelson and Anna Louise Raymond Foundation.

Cases containing exhibits relative to specific subjects about which questions occur in the Girl Scout handbooks are marked on Mondays for the guidance of the girls.

INDIANS HAD A LAKE LEVEL PROBLEM 60 CENTURIES AGO

By GEORGE I. QUIMBY
CURATOR OF EXHIBITS, ANTHROPOLOGY

MODERN LAKE-SHORE DWELLERS suffering property damage and destruction from the high water levels of the Great Lakes can take faint satisfaction in the knowledge that about 6,000 years ago the paleo-Indian shore dwellers could hardly keep abreast of the receding water levels.

Lake Michigan, for example, dropped more than 350 feet below its present level. And Lake Huron was lowered even more to a level at least 420 feet beneath its present stand.

The evidence for this low water stage in the Great Lakes was discovered by two geologists, Dr. George M. Stanley of Fresno State College, formerly of the University of Michigan, and Dr. Jack L. Hough of the University of Illinois.

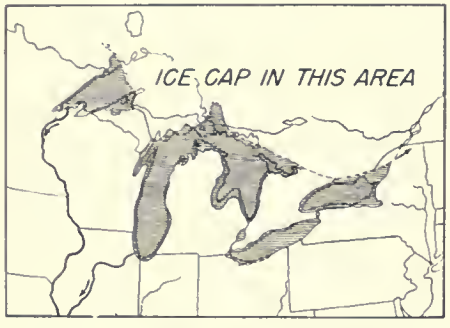

Figure 1. Glacial Lake Algonquin about 5500 B.C. to 4500 B.C. (Map after Hough.)

In 1936–37 Stanley published evidence showing that in the Lake Huron basin there were at least four lower Algonquin beaches between the highest Algonquin shoreline and the earliest Nipissing shoreline. Moreover, the water planes of the lower or latest Algonquin beaches lie essentially parallel to the highest Algonquin beach, and pass southward beneath the plane of the Nipissing beach. This indicates that Lake Algonquin was drained not by upwarping of the land relieved of its ice burden but by the opening of successively lower outlets, and that the great uplifting movement that deformed the highest Algonquin beach was delayed until the water levels had been considerably lowered by drainage.

SUBMERGED MACKINAC VALLEY

Additional evidence published by Stanley in 1938 consisted of his discovery of a deep, submerged valley through the Straits of Mackinac between Lake Michigan and Lake Huron. This valley was about 70 miles long and ranged up to 300 feet in depth. Stanley concluded that a low water stage in the Lake Michigan basin drained through this valley to a lower water stage in the Lake Huron Basin.

In 1952 Hough published proof of the low water stage in the Lake Michigan basin. Hough's evidence came from a study of the sediments on the bottom of Lake Michigan. His analysis showed sand layers of a type laid down in shoal waters and shells of shallow-water dwelling pelecypods and gastropods down to depths of 350 feet beneath the present water level. Moreover, the deep-water types of clay sediments had been eroded to depths of 350 feet beneath the present water level. None of these things could have happened unless the water level had been lowered to 350 feet beneath the present water level.

Therefore, as shown by Stanley and Hough, there was a stage of very low water in the Lake Michigan basin. Hough named this low water stage "Lake Chippewa" (*Fig. 3*).

LAKE HURON DROPPED LOWER

Since Lake Chippewa drained through a 70-mile long river into the Lake Huron basin, it follows that there was an even lower water level in the Lake Huron basin. And this particular low water stage was named Lake Stanley by Hough in honor of Dr. George M. Stanley.

As indicated by Hough, the mouth of the submerged river that connected Lakes Chippewa and Stanley is 50 feet lower than its head, and since the level of Lake Chippewa was 350 feet beneath the level of Lake Michigan, Lake Stanley, being 50 feet lower was about 400 feet below the level of Lake Huron.

Lake Stanley was drained from an outlet near North Bay, Ontario, down the Mattawa and Ottawa valleys to the St. Lawrence Valley. This outlet was made available by the melting of glacial ice that heretofore blocked the Mattawa Valley.

Subsequently the area of the outlet was upwarped as much as 420 feet, a process that terminated Lake Stanley, and inaugurated the Nipissing Great Lakes.

It is suspected that the water in the Lake Superior basin was considerably lowered at the time of Lake Stanley. If the water in the Superior basin drained into Lake Stanley via St. Mary's River and if there was no appreciable upwarping of the land until after the stage of low water, as was the case in the Michigan and Huron Basins, then the level of the Superior basin could have been lowered as much as 412 feet beneath its present level. This figure is based upon the fact that the sill or dam in the St. Mary's River has been uplifted 410 feet since the time of Lake Algonquin. Since the sill now stands at 600 feet above sea level, it stood at 190 feet at the time of Lake Algonquin, or 412 feet beneath the present surface of Lake Superior which is about 602 feet above sea level.

Although actual field evidence demonstrating the drop in water levels of the Superior basin is not yet available, it seems reasonable to believe that at the time of Lakes Chippewa and Stanley, the Superior waters drained into Lake Stanley, and that the level of the Superior basin water was close to that of Lake Stanley or about 400 feet below the present level.

A brief review of the part of the Lakes sequence that includes the low water stage will be of aid in understanding the chronology and archaeology that follow.

ICE SHEET LINGERED

In a period of high water, Lake Algonquin (*Fig. 1*) connected the Huron and Michigan basins making a tremendous glacial lake at a time when the continental ice sheet still occupied much of the Lake Superior basin and the Ontario highlands.

This was followed by a period of falling water levels (*Fig. 2*) brought about by increasing availability of lower outlets east of Georgian Bay as the ice retreated northward. There was still ice, however, on the east coast of Lake Superior and in the Mattawa Valley.

When the ice dam in the Mattawa Valley melted, the water in the Lake Huron basin drained nearly to sea level thus producing Lakes Stanley and Chippewa (*Fig. 3*) as well as a probable low water stage in the Superior basin.

The upwarping of the outlet area of Lake Stanley gradually raised the water levels of the upper Great Lakes basins thus producing the high water stage of the Nipissing Great Lakes (*Fig. 4*). The tremendous flow of water southward, after the North Bay outlet was raised too high for any use by the Nipissing Lakes, caused a rather rapid down-cutting of the outlet near Port Huron. This eventually led to the Great Lakes as we know them today.

Figure 2. The Great Lakes at the time of the transition from Lake Algonquin to Lakes Chippewa and Stanley. The black dots indicate locations of paleo-Indian sites on now extinct beaches. Period indicated is about 4500 B.C. to 3500 B.C. (Map after Hough, with modifications.)

A certain amount of dating can be applied to these lake stages in terms of radio-carbon dates of various events that correlate with the stages. For instance, the Nipissing Great Lakes have been dated at about 1700 B.C.

The transition from Lake Algonquin to Lakes Chippewa and Stanley can be placed at a time at least as old as 3000 B.C. Lake

Figure 3. Lake Chippewa (shaded portion within Lake Michigan) and Lake Stanley (shaded area inside Lake Huron.) The horizontal hatchure represents fresh water lakes; the vertical hatchure represents a marine transgression or arm of the sea in the St. Lawrence lowland and the Ontario basin. About 3500 B.C. to 2000 B.C. (Map after Hough.)

Algonquin is younger than 7000 B.C. and 6500 B.C. as these dates apply to beaches that preceded those of Lake Algonquin. These few dates give us the following chronology:

1. Lake Algonquin (*Fig. 1*).

   Younger than 6500 B.C. but older than 3000 B.C.; probably from about 5500 B.C. to 4500 B.C.

2. Transition from Lake Algonquin to Lakes Chippewa and Stanley (*Fig. 2*).

   3000 B.C. or older, but considerably younger than 6500 B.C.; probably 4500 B.C. to 3500 B.C.

3. Lakes Chippewa and Stanley (*Fig. 3*).

   Older than 1700 B.C.; probably 3500 B.C. to 2000 B.C.

4. Nipissing Great Lakes (*Fig. 4*).

   1700 B.C.–1500 B.C. and probably somewhat later, but earlier than 650 B.C., the date of the post-Nipissing Algoma stage; probably 2000 B.C. to 1000 B.C.

The paleo-Indians (old cultures antedating pottery and agriculture) of the western Great Lakes are known only from lake shore sites in the northern part of the area. One site on the north shore of Lake Superior and one site on the north shore of Lake Huron are associated with extinct beaches, now upwarped hundreds of feet above water level. Both of these sites and possibly a third belong to the period of transition between Lake Algonquin and Lakes Stanley and Chippewa. If peoples of the same culture lived along the shores of southern Lake Superior and southern Lake Huron, their sites would now be far under the water and inaccessible to archaeologists. Thus our knowledge of paleo-Indian life in the period following Lake Algonquin and preceding Lakes Chippewa and Stanley must of necessity come from the upwarped area in the northern part of the Great Lakes region.

ANCIENT BEACH TRIBE'S SITE

The George Lake site near Killarney in the Manitoulin district of Ontario has been intensively explored by University of Michigan field parties under the direction of Dr. Emerson F. Greenman. This site, a quarry-workshop and probably a village or camp, is associated with an old beach 297 feet above Lake Huron. Since some of the stone implements and flakes were rounded and water-worn like the beach pebbles with which they were covered, the site must have been occupied while the beach was being formed.

According to Stanley the beach associated with the George Lake site is one of the beaches formed when the waters were dropping from the Algonquin level during the transition period between Algonquin and Lake Stanley. By means of its drainage relations with water levels in the Ontario

Figure 4. The Nipissing Stage of the Great Lakes, at about 2000 B.C. to 1000 B.C. (Map after Hough.)

basin, this transition can be dated earlier than 3000 B.C. The George Lake site should date from about 4000 B.C. At this time the ice sheet still occupied the east coast of Lake Superior northwest of the site and the Mattawa Valley to the east.

Consequently, about 6,000 years ago there were paleo-Indians in the Killarney area living on the rocky shores of a peninsula in an early post-glacial lake. Here, not more than 50 or 60 miles from the retreating continental glacier they quarried quartzite for the manufacture of chipped stone tools and weapons. Among their manufactures were large, heavy implements such as choppers, semi-lunar blades, ovate pointed blades, quadrangular blades and smaller artifacts such as scrapers of various kinds, perforators, and stemmed blades suggestive of Eden (Yuma) and Sandia-like types.

ARTIFACTS ON MANITOULIN ISLAND

At the eastern end of Manitoulin Island, Ontario, near Sheguiandah is a paleo-Indian site that was investigated in the summer of 1952 by a field party from the National Museum of Canada under the direction of Thomas Lee.

This site seems to have been a quarry

(*Continued on page 8, column 1*)

DEFIES SEA TO COLLECT FISHES FOR MUSEUM

By BARBARA POLIKOFF
BULLETIN STAFF WRITER

Donald Erdman, ichthyologist, who is on an expedition for Chicago Natural History Museum to collect fishes in the waters along the coast of Central America and the islands of the West Indies, has already sent the Museum excellent collections from Puerto Rico and Costa Rica. The story behind these collections is not known, but in a letter to Loren P. Woods, Curator of Fishes, Mr. Erdman revealed that the next collections due to arrive are from Jamaica and were secured only after Caribbean winds and water made life aboard the 37-foot auxiliary sloop *Booby* unpredictable and precarious.

As related in the May BULLETIN, Mr. Erdman started his collecting trip for the Museum during the last week of March, leaving from Puntarenas, Costa Rica. His intention was to collect for five days in each port that he touched. This sounds like an eminently sensible plan, and one not fraught with possibilities of multiple mishaps. But Erdman and crew, consisting of his wife and 5-year-old daughter, have discovered that "touching" port is sometimes a herculean task, especially when their efforts are violently opposed by stubborn-willed squalls. When they did manage to reach Jamaica their stay in port was sometimes as stormy as their voyage on the sea.

WINS BATTLE WITH GALES

The "Booby," 37-foot auxiliary sloop carrying Donald Erdman and companions on Caribbean expedition in quest of fishes for Museum collection. Despite many difficulties due to storms and heavy seas, the little vessel has weathered all hazards, and Mr. Erdman reports successful collecting of specimens needed for research.

The sailing began to get rough for the Erdmans on the way to San Blas Islands off the north coast of Panama when turbulent waters and deadening calms played their own fiendish games with the small sloop. About 150 miles north of Barranquilla a bad squall blew up causing the Erdmans to lose

(*Continued on page 7, column 3*)

RESEARCH AIDED BY AMBER COLLECTOR

By RUPERT L. WENZEL
CURATOR OF INSECTS

THE STORY of the A. F. Kohlman Collection of Baltic amber insects and its acquisition by this Museum, noted briefly in the July issue of the BULLETIN, nicely illustrates a number of points about collectors, collections and museums—so much so that, when I was asked to prepare an article about the collection, I decided to write about these rather than attempt to compete with Willy Ley, who has masterfully treated the story of amber and its inclusions in his book of natural history essays, *Dragons in Amber*.*

OLIGOCENE ANT IN AMBER

The specimen, obtained from deposits along the Baltic Sea, is estimated to be between 30 and 35 million years old. Nature has preserved it perfectly in its transparent envelope of fossilized resin so that today's scientists may study its minute details as easily as in a laboratory-prepared slide. Included in the Kohlman collection acquired by the Museum.

The points in the story of the Kohlman Collection that particularly stand out are: the role of the amateur in building up valuable scientific collections; the role museums play in preventing or arresting the dissipation of such collections by acquiring and preserving them for future study; the frequently fortuitous thread of circumstances by which a museum is enabled to fulfill this function; the piecing together of bits of information that the staff must frequently resort to in order to learn something of the collection and collector; and the museum's part in making such study material available to qualified researchers so that it either begins or continues to function in the sphere of scientific inquiry.

We have almost no direct information about Mr. Kohlman except that he was single, was a dispatcher for the Chicago and North Western Railway, and that he lived for many years in Milwaukee and later moved to Racine, Wisconsin. But it is obvious from the nature of his effects—such as we have seen—that he was in many ways a man of singular interests and accomplishments. Judging from various dates on scraps of paper and newspaper wrappings that accompanied the collection, it would appear that he brought together at least the greater part of his amber collection during the years 1900 to 1915, and that he lived in Milwaukee during this time.

NOT FOR DILETTANTES

In all probability, his interest in these insects arose through an interest in microscopy. Not only did his library contain numerous works on this subject, but his other collections reflected the interests of a member of that rapidly vanishing group, the amateur microscopists. In addition to his amber insects, Kohlman built up respectable slide collections of diatoms and tissue preparations, but he had only a relatively small number of the kind of slide preparations that were simply items of beauty or curiosity, or examples of the technician's skill that characterized the collections of less erudite microscopists. Kohlman's collections bore the stamp of the expert amateur. Histology (tissue study) is not a subject for the dilettante to pursue, nor is the study of amber insects when carried beyond the mere collecting stage. Some of his identifications of amber insects would have done credit to the best professional systematic entomologists.

Kohlman's interest in optics extended further than merely looking through a microscope. That he was an expert photographer is evident from a series of excellent photographs of diatoms and amber insects that he made, all in duplicate stereoscopic views. Later, he turned to amateur astronomy. He built an 8-inch reflector telescope, and began the construction of a 5- or 6-inch refractor. Toward the end of his life, if we may judge from the publication dates of his books, he became interested in mystic philosophy.

It was at about the time of his death, several years ago, that his amber collection first came to the attention of this Museum. A visitor to the Division of Insects mentioned that someone in lower Wisconsin was reputed to have a collection of amber insects. Lack of further clues made it impossible to pursue the matter and it was forgotten.

SAVED FROM DISCARD

After his death, his sisters advertised his effects for sale at public auction. The amber insects were not listed. Not only did the family regard the collection as being of little value, but they had even thought of throwing it out. Fortunately, his microscope was listed, and this attracted the attention of F. E. Trinklein, teacher of physics and chemistry at Lutheran High School in Racine. He attended the auction in the hope of getting the microscope for his school. He saw the amber collection in the home among Kohlman's effects and, realizing its scientific value, purchased it and the telescope for a nominal sum.

Mr. Trinklein kept the collection at the school, but recently, being anxious both to place the collection in a more suitable institution and to raise some funds for the science department, he decided to sell it. He offered it to Chicago Natural History Museum among others. Members of the Museum staff examined it and recommended its purchase. A university was also interested in obtaining it, for teaching purposes. Such a disposition would probably have resulted in the dissipation of much valuable research material because this particular university has no specific equipment and staff —as does a museum—that are committed to the preservation and protection of such collections over long periods of time. The university offered to give up its bargaining position if we would sell them a small duplicate collection at a later date. This was agreed upon, and thus the collection came to this Museum.

But this is not the end of the story, for in inventorying the collection so that it could be accessioned and paid for, several specimens were found which obviously were frauds. This made it necessary to determine the authenticity of the collection as a whole. Not a specimen had data as to locality and source, and although the appearance of the material was that of perfectly good amber, we did not care to be in the company of those many "experts" who have been cheated by fakers of amber fossils or who have been deceived by specimens entrapped in modern or fossil copal gums. Physical and chemical tests satisfied us that the amber was genuine. About 90 per cent of all amber is Baltic amber and since 99.5 per cent of this comes from the Samland Peninsula north of Königsberg, Prussia, there is little chance that any of the Kohlman specimens came from any other locality.

CHIEF SOURCE OF AMBER

Approximately 90 per cent of the world's amber supply has come from the Samland Peninsula which, as map shows, is on the Baltic Sea in what was formerly East Prussia. It is now under the domination of the U.S.S.R. and little if any of its amber yield is available at present.

* New York, The Viking Press, 1951.

After the collection had been accessioned, the question arose in our minds as to whether or not the material acquired represents the entire Kohlman collection. Numerous bits of evidence indicate that it does not. First, Mr. Trinklein informed us that insect amber pieces turn up from time to time in jewelry worn by young ladies in the school. This would seem to indicate that Mr. Kohlman had disposed of a number of pieces locally after his interest had diminished. Second, most of his photographs seem to have been of the rare and unusual or especially perfect specimens, a number of which are no longer in the collection. The "cricket" shown in the accompanying illustration is such a piece. There is no reason to believe that any of these specimens did not belong to Kohlman.

There are several other kinds of evidence involving his classification and numbering system and percentages of groups represented in the collection, but the most impressive evidence is the large box of amber cuttings that he left. These are the raw chunks of amber from which the pieces containing insects were cut for grinding and polishing. The number of cuttings is far greater than would be expected if only those pieces that are now in the collection were cut from them. It is possible that he may have had as many as six thousand prepared slide specimens. At present the collection contains approximately 1,450 of these and another 800 unmounted and mostly unpolished specimens.

Although the Museum was unable to prevent such dissipation of the collection as may have occurred, what it has preserved still ranks as the second largest collection of Baltic amber inclusions in America. That it is by no means an unimportant collection in the world picture is indicated by the fact that the most recent study of amber spiders was based on a total of 144 specimens, including the combined material of the British Museum (Natural History), the U. S. National Museum and several other museum sources. The Kohlman collection contains 196 spiders.

BEST COLLECTION BOMBED

The relative importance of any existing amber collections has been much augmented by several events of the last two decades. The output of the amber mines was much diminished prior to World War II. They are again producing but are in Russian hands. The most important amber collection in the world—that of Albertus University in Königsberg—was destroyed by bombing and fire during World War II. This collection of more than 100,000 specimens was not only the largest, but contained the finest specimens, selected from the inclusions that were sorted out at the government mines. In addition to amber inclusions, the collection also contained many historically important and extremely valuable pieces of carved amber and jewelry.

Further, while in Vienna in 1951, I was told that the Bachofen-Echt collection, reputed to be second in importance, had been sold piecemeal to jewelers by Bachofen-Echt's widow. This collection had earlier been strewn in the streets of Vienna by looting Russian soldiers. Most of it was salvaged and then offered for sale to various museums, without success. The fate of this collection points up the fact that the existence of museums is not in itself insurance against the loss of such valuable materials; in many instances museums can preserve these collections for study and re-study, by present and future generations, only if they can raise adequate funds to purchase and house them. Frequently the heirs to such collections ask more money for them than museums are able or should be expected to pay.

For this reason many modern scientific workers arrange while they are still living that their personal collections and libraries are committed to an institution of their choice by bequest, deposit, or sale at a nominal price.

Although researchers have published on amber insects for more than a century, there

'CRICKET' IN BALTIC AMBER

Reproduced from a photograph among papers accompanying collection of the late A. F. Kohlman, recently obtained by the Museum. Note air bubbles in the amber.

is still much to be learned from the study of these fossils. For historical reasons, most American entomologists have been unable to study amber insects first hand. Within a few weeks after the Kohlman collection arrived at Chicago Natural History Museum, parts of it had been placed in the hands of specialists for study. The first of these specialists that we have heard from indicates that he is able to see structures on our specimens that the European authorities could not see on theirs, and that as a result of this he can make improvements in the classification of the families of insects in question. We hope to distribute more of the collection to competent workers shortly.

Excellent specimens of insects preserved in copal can be seen in the exhibit of resins in Stanley Field Hall.

BATTLE WITH SEA—

(*Continued from page 5*)

a sea anchor, 200 feet of line and their dinghy. To add to the piling up of misadventures, a five-gallon can filled with fish in formalin leaked over the cabin and deck. Characteristically, Mr. Erdman reassured Curator Woods that the fish were saved, never mentioning the effects of the formalin on his family's daily living habits. The climax to their difficulties was the breaking of a stay, which couldn't be repaired for six days because of the rough waters. The Erdmans had no choice but to let wind and water have their will, and uncooperative as those two elements proved to be, their combined efforts drove the *Booby* exactly where its crew didn't want her to go—300 miles off their course to Serrana Bank.

After the Erdmans reached port in Jamaica their luck didn't improve. A squall caused the *Booby* to break loose from her anchor and crash into the dock, dragging her secondary anchor, a 150-pound kedge, onto the beach. The *Booby's* next visit to shore was made in a similarly unorthodox manner—this time she dragged a yacht club mooring with her. When, to add to these troubles, a heavy chain snapped and the stalk of the *Booby's* new anchor bent, Mr. Erdman began to be plagued by disturbing doubts as to the adequacy of both his gear and himself. But his confidence was restored, in part at least, when still another squall blew up and a yacht broke loose from her anchor while the *Booby* rode serenely aloof from the chaos, preserving all her poise as a true ship, with her mudhooks holding firmly.

GIFTS TO THE MUSEUM

Following is a list of the principal gifts received during the past month:

Department of Botany:

From: Academy of Natural Sciences, Philadelphia—5 seeds of Scrophulariaceae; Holly Reed Bennett, Chicago—105 grasses and sedges, Chicago and Indiana Dunes; University of California, Berkeley, Calif.—30 seeds of Scrophulariaceae; Luis Mille, Bahia, Ecuador—9 Caracolillo tree leaves and seeds, Ecuador; Museo Nacional Historia Natural, Santiago, Chile—5 *Escallonia* species, Chile

Department of Geology:

From: Richard M. Bookwalter, Chicago—2 specimens of silicified wood, Petrified Forest, Ariz.; Charles A. Ross, Urbana, Ill.—insect wing in nodule, Illinois

Department of Zoology:

American Museum of Natural History, New York—2 lots of fishes, Bimini, Bahamas; Carnegie Museum, Pittsburgh—4 eels and a blenny, Guam; Chicago Zoological Society, Brookfield, Ill.—a mammal; Riccy Deliberto, Westmont, Ill.—a garter snake, Illinois; Delzie Demaree, Ocean Springs, Miss.—a collection of marine shells, Mississippi

LAKE LEVELS—

(*Continued from page 5*)

and work area where the Indians obtained quartzite for the manufacture of tools and weapons. A quantity of large blade-shaped objects up to 10 inches in length and two pounds in weight were found.

The locus of these finds is on the slope of a hill that may have been an island at the time of the paleo-Indian occupancy. The finds seem to be associated with or above a strand line about 60 to 90 feet above Lake Huron, a situation that offers opportunities for establishing the earliest possible date for the occupancy of the site.

About 80 to 90 feet above Lake Huron is the level of the Nipissing beach in the general area of the Sheguiandah site. The distribution of the quartzite flakes and artifacts at and above the 90-foot level rather than below it suggests that the occupancy of the Sheguiandah site dates from the Nipissing Lakes stage. On the off-chance that the occupancy was associated with a beach strand slightly higher than the Nipissing, the site would date from a time late in the transition from Lake Algonquin to Lake Stanley when the water levels had dropped more than 250 feet from the Algonquin level. The site could not be earlier because previously it would have been covered first by ice and later by water.

Thus the Sheguiandah quarry and workshop dates from a time later than the George Lake sites at nearby Killarney which date from about 4000 B.C. Moreover, it is possible that the Sheguiandah site, if associated with the Nipissing beach, dates from 1500 B.C. or later.

OLD THUNDER BAY CAMP

Near Pass Lake in the Thunder Bay District of Ontario along the north shore of Lake Superior there is an interesting Paleo-Indian camp and workshop site that was explored for the National Museum of Canada by Dr. Richard S. MacNeish.

At the Brohm site, as this is called, artifacts were associated with extinct beaches at an elevation of about 220 feet above the present level of Lake Superior. The position of some of the artifacts in the beach gravels and beneath the humus layer on top of the beach indicates that the artifacts were deposited near the end of the deposition of the beach gravels or somewhat later, but before the formation of the humus layers on top of the beach gravels.

The artifacts found at the Brohm site were made of a jaspery taconite which is found in the region. Among the tools and weapons of taconite were various kinds of scrapers, blades, choppers, and projectile points with collateral and oblique ripple flaking. Seven of the 14 projectile points found were of the Plainview type—a leaf-shaped form with a concave base, and grinding of the sides of the point toward the base.

Plainview points previously have been found in the Plains where they were primarily associated with the hunting of a kind of bison that has now been extinct for many centuries.

Radiocarbon dates of events that can, one way or another, be associated with Plainview points indicate a period of unknown duration beginning at some time after about 8000 B.C. However, the Plainview points as well as other cultural materials from the Brohm site must date from a period later than Lake Algonquin but perhaps earlier than the low water of Lakes Chippewa and Stanley, probably about 3000 B.C. or perhaps 4000 B.C.

WATER HIDES HISTORY

Of the paleo-Indians who lived along the shores of the Great Lakes during the period of Lakes Chippewa and Stanley, we know nothing. Their sites are all under water, 350 to 400 feet under water in the Michigan and Huron basins, and probably far under water in the Superior basin also.

One can imagine the distress of these shore dwellers as they moved their camps to keep up with the rapidly receding shore lines.

And when the North Bay outlet was closed by upwarping of the land, and the lake waters rose rapidly to levels even higher than those of today, the paleo-Indians constantly had to move to higher land until about 1500 B.C.

It would be interesting to investigate the sites of the low water period. If anyone knows how to locate and obtain ancient tools, weapons, and utensils 350 to 400 feet under water the writer would appreciate the information.

LECTURE TOURS CONTINUE TWICE DAILY IN AUGUST

Tours of Museum exhibits will be conducted twice a day, mornings and afternoons, during the month of August (Monday through Friday). Each morning tour, except Thursday, is a general survey of one department of the Museum. The afternoon tours (and Thursday morning) are general surveys of the highlights of the exhibits. Following is the schedule:

Mondays: 11 A.M.—People and Places
2 P.M.—Highlights of the Exhibits

Tuesdays: 11 A.M.—The Story of Plants
2 P.M.—Highlights of the Exhibits

Wednesdays: 11 A.M.—The Earth's Story
2 P.M.—Highlights of the Exhibits

Thursdays: 11 A.M. and 2 P.M.—Highlights of the Exhibits

Fridays: 11 A.M.—The World of Animals
2 P.M.—Highlights of the Exhibits

No tours are conducted on Saturdays and Sundays, but the Museum will be open.

STAFF NOTES

Donald Collier, Curator of South American Ethnology and Archaeology, was the lecturer on "Live and Learn," educational television program of NBC's Public Service Division on July 19. His subject was "Ancient Civilization of the Andes." This program, given each Sunday at 11:30 A.M. over station WNBQ, is presented in the form of a half-hour classroom session in which authorities on a variety of academic subjects present their story with demonstrations by means of charts, pictures, blackboard diagrams, and specimens. The classroom audience is formed by a group of university students who frequently address questions to the lecturers . . . . **Dr. Fritz Haas,** Curator of Lower Invertebrates, was the representative of the Museum at the 1953 meeting of the American Malacological Union recently held at Lawrence, Kansas. He spoke on the Walter F. Webb Collection of non-marine shells in this institution, and told of its importance to science . . . . **Miss Elsa Graf** has been appointed Assistant in the Division of Memberships. She obtained her education in universities of Europe and Mexico. Former employers are the Allied Jewish Community Council of Denver and the Chicago Association of Commerce and Industry . . . . **Miss Jane Ross** has been appointed Reference Librarian. She recently returned to this country from Nagoya, Japan, where she was a teacher in the elementary school for dependents of U.S. servicemen. Prior to that she was educational director of the San Diego (California) Zoo. She worked in the Library of this Museum once before on a temporary appointment. She is a graduate (B.S.) of Ohio State University . . . . **Loren P. Woods,** Curator of Fishes, and **Robert F. Inger,** Assistant Curator of Fishes, attended the Great Lakes Research Conference at Douglas Lake in northern Michigan, July 28–31.

NEW MEMBERS

The following persons became Museum Members from June 16 to July 15:

Associate Member

P. Sveinbjorn Johnson

Annual Members

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Going fishing? See the Museum's group showing underwater scene in a small lake.

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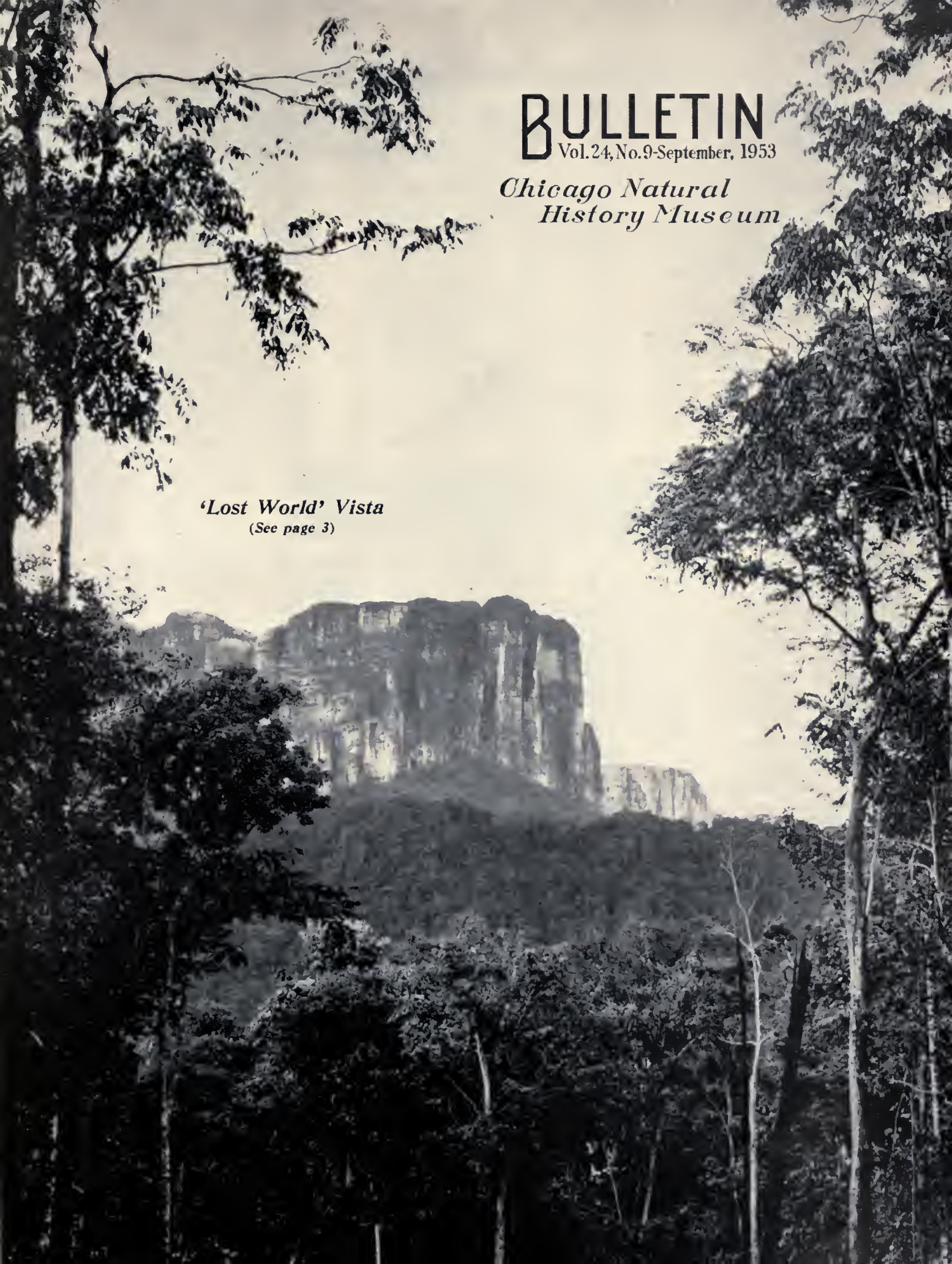

'Lost World' Vista

(See page 3)

Chicago Natural History Museum

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Members are requested to inform the Museum promptly of changes of address.

DIM PROSPECT FOR GOURMETS

BY FRANCIS DROUET

CURATOR OF THE CRYPTOGAMIC HERBARIUM

For more than a century, researchers have been studying microscopic algae in cultivation in the laboratory. Individual species are, by a long and tedious process, segregated from other algae, bacteria, and fungi and then grown in glass containers. These "pure cultures" have been the bases of many of the fundamental studies of the nature and habits of protoplasm and cells.

Recently, in the interest of efficient production of food for the increasing population of the world, scientists in several countries have made efforts to grow single-celled algae cheaply and in quantities suitable for feeding human beings and livestock. Since some species reproduce rapidly, contain more than 50 per cent protein, and occupy little space, these efforts have seemed promising. Probably at least a hundred species—green, blue-green, and others—have been involved in the experiments, with the principal concentration upon the green alga *Chlorella pyrenoidosa*. A symposium edited by J. S. Burlew and just published by the Carnegie Institution of Washington, entitled *Algal Cultures from Laboratory to Pilot Plant*, sums up the projects now under way.

Considerable research has been done at this Museum on these cultivated algae, although no living cultures have been maintained. A large collection of preserved microscopic algae is housed here, and continuous studies in the classification of these plants have been carried on for fifteen years. Hundreds of cultures employed by those who cultivate algae in all countries, as well as a large proportion of the original specimens upon which the descriptions of new species were based, are represented in the Museum's cryptogamic herbarium. An exhibit of models of various kinds of microscopic algae may be seen at the north end of the Hall of Plant Life (Hall 29—Martin A. and Carrie Ryerson Hall).

October 5 Is Museum Members' Night . . .

'OPEN HOUSE' TO BE FEATURE OF EVENING; FLOWER PRINTS IN SPECIAL EXHIBIT

After last year's Members' Night at the Museum many visitors expressed a desire that the next occasion be planned to give them more time to roam behind the scenes. This request was kept in mind and, consequently, this year on Monday, October 5, from 7 to 10:30 P.M., Members' Night will offer guests a chance to return to the studios, workshops, and laboratories that intrigued them last year as well as to visit other places on the Museum's third and fourth floors that they haven't yet seen. On hand to answer questions and explain the work of the different departments will be curators, taxidermists, preparators, artists, assistants, and Raymond Foundation lecturers.

The featured exhibit of the evening will bring delight to all interested in flower prints. A set of 32 magnificently colored folio plates, published in London between 1798 and 1807 by the English physician and botanist, Robert J. Thornton, under the title *Temple of Flora*, will be lent for the occasion by their owner, Walter S. Ross of Chicago. The Department of Botany is preparing a supplementary display of books from the Museum's Library showing the development of techniques of botanical illustration from simple woodcuts as used in old herbals to modern color plates.

All Members of the Museum and their guests are invited to attend "open house." Admission will be by presentation of membership card or the invitation that will be sent to Members. "Open house" will begin at 7 P.M. but the exhibition areas of the Museum will be open at 6 P.M. Those who wish to come early and dine at the Museum may do so from 6 to 8 P.M. in the Cafeteria.

Free motor-bus service has been arranged for the convenience of Museum Members and guests. Buses will leave Michigan Avenue and Van Buren Street at 15-minute intervals beginning at 6:30 P.M. Returning out of Grant Park, the last bus will leave the Museum at 10:45.

Australasian Native Arts Exhibit Continues

The special exhibit of Australasian Native Arts that opened last month in Stanley Field Hall will remain on view through September 28. One section of the display shows the traditional art forms of the Maori people of New Zealand; the other illustrates the culture of the aboriginal tribes of Australia. Featured is a series of fifty large photographs by Cyrus Townsend Brady, Jr., of New York.

Pacific Coast Expedition

An expedition to study the life of coastal communities of shelled creatures on Vancouver Island and in the Red Woods of Oregon and Washington is being conducted by Dr. Fritz Haas, Curator of Lower Invertebrates. He is operating from a base at the Biological Station at Nanaimo on Vancouver Island and will be occupied for about two months with collecting invertebrate specimens and research into the ecology of the animals.

THIS MONTH'S COVER

"This is the forest primeval"—the thickly clustered trees at the base and up the slopes of one of the highest mountains in Venezuela's "lost world" of lore, legend, and fact. The photograph was taken by Dr. Julian A. Steyermark, Curator of the Museum's Phanerogamic Herbarium, who has just returned from an eventful and hazardous five-month expedition in the area. The scene on the cover shows a corner of Chimantá-tepuí from the expedition's base camp at an elevation of 3,000 feet. At the foot of the bluffs, themselves more than 1,000 feet high, Curator Steyermark camped for several nights and collected plant specimens during the day. The densely forested slopes were at an angle exceeding 70 degrees in various places, and the Museum explorer had to climb these several times. Many unusual plants, a number of them new to science, were collected. Curator Steyermark reached the summit of this mountain and there made further important collections. His account of the expedition appears on page 3.

BREAKING TRAILS THROUGH 'LOST WORLD' OF VENEZUELA

By JULIAN A. STEYERMARK
CURATOR OF THE PHANEROGAMIC HERBARIUM

AFTER FIVE MONTHS in the field, the Chicago Natural History Museum expedition to the famous "lost world" of Venezuela, led by the writer, returned on August 7 with 1,500 numbered collections of plants amounting to at least 10,000 herbarium specimens.

The objective of the expedition—to reach the summit of Chimantá-tepuí and collect its plants—was finally attained after months of cutting trails and establishing various camp sites. Chimantá-tepuí, together with the adjacent Acopán-tepuí, is the largest of the tepuís (table mountains) in Venezuela. During the first month of the trip the western edge of Chimantá-tepuí was climbed and four camp sites were established along a trail originally started by the Venezuelan ornithologists, William H. Phelps, and his son, Billy Phelps, Jr. Later the expedition climbed this mountain from its southern side, the first time this had ever been attempted. Nearly two weeks were spent approaching this side from the Río Caroni and Río Tirica, poling the three canoes upstream past dangerous rapids and portaging over high waterfalls. Beyond this point at approximately 3,000 feet altitude the first base camp along the Río Tirica was established in dense rainforest. After two weeks of collecting in this area the expedition moved to a new camp site nearly twice as high at the base of the main wall of vertical sandstone bluffs, whose rosy-pink sides towered a thousand feet or more above the camp. Many plants were found here that were not seen elsewhere on the entire trip.

In order to reach the summit, the trail had to cross the Río Tirica in its upper reaches. It was at this point that a high magnificent waterfall surrounded by dense forest was discovered by the expedition. The constant stream of foamy water that poured from this falls was heard several miles away. I estimated its height to be twice that of Niagara. So far as known, this waterfall had not been seen previously by anyone, and the Indians named it Steyermark-Meru or Steyermark Falls in my honor.

Two more camps were made after crossing this stream. Beyond the final camp difficulty was encountered in penetrating the upper part of the mountain through a dense jungle of interlacing curving air-roots and branches of dwarf trees, mostly species of the genus *Clusia*, covered with wet moss and liverworts. Instead of the trunks growing straight and upright, they branched horizontally and curved in all directions, forming sinuous aerial obstacles that had to be cut with machetes before any progress could be made through the woody entanglement. In order to follow the trail it was necessary to step from one branch of aerial root to another and to lower oneself to the wet ground and then go back up again onto an aerial branch or root. An hour or more of this gave one the feeling that he was following in Tarzan's footsteps.

Eventually the climb upward led to a more open stretch of a plateau covered with large grotesque sandstone boulders and bluffs that made it necessary to climb and traverse rocky terrain for a few miles. Now, working our way upward, the forest became still more reduced in size to tiny trees and shrubs of motley greens, russets, and purples.

CLEARING A CHANNEL

Indians heaving rocks from rushing stream so that dugout canoe laden with botanical treasures may be pulled safely through the rapids in remote "lost world" wilderness.

After nearly a week of trail-making, the summit of the mountain was sighted and, with the thrill that comes from scaling unknown and previously unclimbed heights, was finally attained. Here one really felt as if he had placed foot on a new part of the earth's surface, for on the summit appeared an entirely new array of vegetation, different from anything hitherto seen. The plants were in weird shapes, with unusual leaves and peculiar flowers, and had assumed an aspect of low herbs and dwarf shrubs. Flowers of many colors were in evidence. Some plants had small thick leaves covered beneath with a dense gray or brown woolly cloak. The leaves of other plants were silky gray and matted to form beautiful rosettes set on top of a naked woody stem, often resembling alpine or andean types of plant growth. Much of the vegetation belonged to the sunflower, melastome, madder, heath, and pitcher-plant families, but members of the xyris family as well as the orchid and fern family were also prominent.

Walking on the summit required a sure foot. We had to walk slowly and step gingerly from one place to another, for progress was frequently interrupted by sudden deep rocky fissures or crevasses, a common occurrence on the summit, making it necessary to lay poles, cut from the largest of the dwarf trees, across these crevasses as bridges. Some of these fissures were fifty feet or more deep. It can easily be imagined what might have happened if one were to slip and fall into one of these rocky surface-cracks.

The summit was studded with weird large boulders and odd, often mushroom-shaped formations of sandstone. Moist cave-like shelters, often dripping with water, were found wherever the large rock formations occurred, and unusual ferns, hitherto unknown, of the genus *Pterozonium* clung to the shadier portions of such boulders.

At one place on top, the expedition encountered a large basin-like, swampy depression filled with water, resembling a tiny alpine lake. Here the landscape took on a weird appearance, resembling one of the Colombian páramos so well depicted in a mural in the Museum's Hall of Plant Life (Martin A. and Carrie Ryerson Hall). At this swamp solitary woody trunks rose five to ten feet high, looking like erect statues scattered over the landscape. Each one was bare in the lower part, but closely enveloped with narrow olive-green leaves, the undersides of which were covered with a dense brown woolly growth. The stem was similarly wool-matted. A single large cluster of orange flowers, about the size of a dandelion, was at the very top of the stem. The appearance of the plant, with the thickly set drooping reflexed leaves, resembled some of the species of *Espletia* of the Colombian Andes, but the genus is unknown outside of the Andes of South America. It also resembled some of the peculiar woody *Senecios* from the Mountains of the Moon in Africa. Only careful study will reveal the true identity of this peculiar member of the sunflower family (Compositae). At this writing it is safe to state that the plant is not one of the Espeletias and it may well prove to be an undescribed genus. Many other peculiar members of the sunflower family also were found on the summit.

UNEXPECTED ADVENTURES

Finding and collecting these weird plants, most of them new to science, was an unforgettable thrill. One week of difficult collecting was spent on the summit, and seven Indians were loaded down with the prize

collections, amounting to thirty packages crammed full of plants laid between sheets of newspaper. Now it was necessary to transport these fresh collections, some of them gathered nearly a week earlier, back to the main camp for drying and packing.

The return to our destination at the main camp, situated at the base of a high bluff, was a two-day trip of hard hiking over

'LOST WORLD' ODDITY

One of the weird plants encountered on the summit of Chimantá-tepuí in Venezuela. It belongs to the same family as thistles, daisies, and asters.

steep slippery trails. We had calculated a supply of just enough food to last us for this return trip. But misfortune struck in heavy rains that played havoc with our plans. During the past two days the streams had risen, and as we approached the upper reaches of the Río Tirica below the newly discovered waterfall we found, much to our dismay, that this rocky stream, which we had succeeded in fording on foot two weeks earlier, was now impassable. It was a raging torrent spouting and pouring past boulders with a tremendous fury at the rate of thirty or forty miles an hour.

Our only hope at this time was to fell the tallest trees bordering the river and make them fall in such a way that they would eventually form a bridge. However, at this particular crossing, two islands separated us from the other side of the river, and even if we were successful in felling a tree in the right direction, it would only land us as far as one island, from where we would have to cut down another tree to fall successfully over the second island, and eventually from the second island cut a tree to land on the other side of the river. At other places up and down the stream from this crossing, the river was too wide for bridging by trees; so the island crossing was our only hope.

TREES CARRIED DOWNSTREAM

Unfortunately, we had left our sturdiest ax back at our main camp, located several miles beyond on the other side of the stream, and the only ax with us was a smaller one with a lighter-weight blade and smaller handle. It was discouraging, after having worked half an hour or more to cut a tree a hundred or more feet tall, to watch hopefully as it fell in the right direction towards the island, only to be swept away in the strong torrent of the stream and quickly carried downstream as if it were a matchstick. One after another of these giant trees was thus swept away until we wondered about our prospects, if any, for getting across.

Later in the day, one of the Indians succeeded in felling a tree so that it became wedged into a large rock on the first island and stayed there securely. However, there were still two more bridges to make before we could cross over to the other side. As the afternoon was now drawing to a close and our ax handles kept splitting, it was too late to try to move on, and camp was made along the river for the night. But it rained again. When we awakened the following morning we found the river just as violent as the day before, and in spite of all our efforts we failed to cross the river that day.

The morning of the third day we were greeted by the welcome sight of a much lower river-level, for several large rocks that were previously covered by swift water were exposed. This enabled the Indians to wedge stout tree trunks between the rocks, and by agile footwork they jumped across from tree trunk to rock and eventually to the other side of the stream. We all watched breathlessly as they cut away at a giant leguminous tree while it began to rain again. Despite what seemed an endless time waiting for this tree to fall, the Indians finally completed the task with their machetes, one hacking away at one side, the other working hard on the other side, until finally the tree gave way and crashed with a mighty roar from the other side of the river onto the second island. Now we had continuous passage from one side of the river to the other.

I took off my shoes and walked barefooted across the slippery tree trunks over the raging river until I finally reached the other side. All the plants and sleeping packs were eventually carried across safely, and we hurried to climb the steep slope beyond. We continued on the trail back to our main camp at the base of a high bluff and reached our destination in the afternoon of the same day. The valuable plant specimens were placed between dry newspapers, numbered, pressed, and dried over the stoves, and saved for posterity. This was a great relief.

We had many unusual and exciting experiences. A number of poisonous fer-de-lance snakes were seen, as were large hairy spiders the size of a large dinner plate. At one point near the summit during the first part of the trip the Indians were so cold, wet and miserable that they planned to desert the expedition. Only quick talking in Spanish saved the day. On another occasion some families of Indians had come upstream to help move the equipment from base camp to a camp higher up in the mountains. They had made camp on an island across from our camp. During the night the river rose fifteen feet. Our Indians awakened in time to shout to them of the impending danger and rushed our canoes across the flood waters to rescue men, women, and children from the other side, and bring them all safely to our side of the stream.

INDIAN COMPANIONS

Throughout the trip Indians belonging to the Arekuna tribe were employed. They were always found to be trustworthy, reliable, helpful, and pleasant companions. Their skills in building shelters thatched with palm or large Philodendron leaves, their intimate knowledge of woodlore, skill in using various native vines for tying and the latex of trees for caulking cracks in canoes, adeptness in fishing and hunting, clever maneuvering in navigation of treacherous rapids, and ability to carry cargo over difficult trails, as well as sense of direction in making trails to various parts of the mountain, all combined to make their services indispensable. As many as fifteen Indians were employed at one time to carry the food and equipment.

Cassabe is the staff of life to the Indians. Made from the root of *Manihot*, and related to the plant from which tapioca is derived, the final baked product is a white substance, at first flabby in texture, eventually stiffer.

REPTILE AS DINNER DELICACY

Indian helper to Dr. Julian A. Steyermark on "lost world" expedition roasts the carcass of a caiman (a member of the crocodile family) to tempt appetite of tired explorer after a hard day of collecting plants.

It usually appears in a compressed large plate-like circular form. A hot pepper sauce, called *kumachi*, made from cooked peppers, salt, and a little water, is the other main item in their diet.

Our expedition, in addition to the cassabe, carried black beans, rice, oatmeal, coffee, native brown-sugar (papelón), spaghetti, canned corned beef, and cocoa. These foods

(*Continued on page 6, column 3*)

ARCHAEOLOGICAL 3-D APPLIED BY SOUTHWEST EXPEDITION

By JAMES T. BARTER
STAFF ASSISTANT, SOUTHWEST ARCHAEOLOGICAL EXPEDITION

TODAY THE RAGE IS 3-D. Hollywood, which for the last few years has been fighting against high production costs as well as public apathy toward much of its product, has now turned to various forms of three-dimensional pictures in a hope that its failing box office will be revived.

To the staff of Chicago Natural History Museum's Southwest Archaeological Expedition digging this summer as in nine previous years near the town of Reserve, in west-central New Mexico, three dimensions are old stuff. Of course we are talking about archaeological 3-D, not optical 3-D.

Archaeological 3-D is a system of looking at prehistoric cultures from more than one viewpoint, that which we used to call the "well-rounded approach." In looking at cultures with this in mind, we utilize the findings of botanists, climatologists, zoologists, physicists, and other scientists in order to round out our fund of knowledge.

Our three archaeological dimensions are time, space, and culture. We are interested in the broad history of a people. We want to know how long they lived in one area, why they moved and where they went, with whom they traded, and how far they traveled on trading expeditions. We are also interested in more homely things, such as the crops they raised, the tools they made, the utensils they used, the animals they hunted, at what age they died. In short we are interested in everything about these ancient people. So you see that if we were to neglect any of the three dimensions we would have a flat picture of the life of the people.

THE FIRST DIMENSION—TIME

Chicago Natural History Museum's Southwest Archaeological Expedition has for ten seasons concentrated on the problem of a rational delineation of the history of one of the ancient Southwestern cultures, that of the Mogollon people of Pine Lawn Valley. The span runs from 2500 B.C. when the Egyptians were building pyramids to A.D. 1100 when the Christians were starting forth on the first Crusade. Excavation of more than fifteen sites has made it possible to trace the rise, growth, and fall of the Mogollon people during these three and one-half millenia.

It is possible to follow the development of agriculture (corn, beans, squash), of pottery, and of tools, utensils, and weapons. The sum of observations and the accumulation of artifacts bore witness to the fact that the Mogollones lived in a changing world, as we do today. Change was evident in everything from corn to pottery. Through the centuries, by breeding and selection, the ear of corn became longer and the rows of kernels decreased from 14 and 16 to 8 and 10. Pit houses, at first roughly circular, became rectangular and eventually gave place to rough masonry surface-dwellings of contiguous rooms. The pottery changed from generation to generation in shape, color, and mode of decoration.

But what happened to the Mogollon culture after A.D. 1100? Did it die out or did it continue to grow and expand until the Spaniards came in 1540? Early work caused us to be fairly sure that this civilization continued to flourish after A.D. 1100 and, in fact, thereafter reached its classical height. This summer in an effort to trace the rise, spread, and decline of the Mogollon culture we are again conducting archaeological excavations. This year the staff consists of Dr. Paul S. Martin, Chief Curator of Anthropology and leader in eighteen previous seasons of Southwest excavations in this and other areas, Dr. John B. Rinaldo, Assistant Curator of Archaeology, E. D. Hester, Allen Lapiner, David Mabon, Joseph Shaw, and the writer.

TOMB INTEGRAL WITH HOME

Adult burial exposed by excavations of Southwest Archaeological Expedition on this summer's "dig" in New Mexico. The skeleton and accompanying mortuary pottery can be seen under earliest floor of ancient habitation of little-known Indians.

THE SECOND DIMENSION—SPACE

The site—"ruin," or "pueblo"—lies on a ridge several hundred feet above and overlooking the San Francisco River valley on land owned by Owen McCarty and Ray Hudson. It is roughly in the northeast section of the Mogollon culture area—an area that covers thousands of square miles in eastern Arizona and western New Mexico. The ruin was easily recognized because the fallen walls formed a mound 10 feet in height covering roughly an acre in extent. Close examination revealed rooms outlined by portions of standing walls, broken pieces of pottery (potsherds), arrowheads, stone mills (metates) for grinding corn, and large rectangular depressions that we have dubbed "plazas."

The mound resembled a rocky Vermont hill, but it should be borne in mind that each rock had been carefully selected and often shaped and once was part of a wall. We selected this site because the scattered bits of pottery on the surface were "late," that is, were typical of a pottery style that was popular during and after the years 1200–1250. Since these pieces of pottery were late, we guessed that the site was also late and was therefore representative of the period we wished to know more about.

For six weeks (at the time of writing) a crew of six men had been sweating it out, picking, shoveling, moving dirt, and throwing rocks, for excavating in such a ruin where the fill is composed largely of collapsed walls is tough work. The walls in some places are seven feet high and it takes staunch effort to toss out 15-pound boulders and tons of damp earth. We estimate that some of the rooms contained 10 to 12 tons of debris and all of this has to be removed carefully by manpower without the benefit of earth-moving machinery. In one morning alone we moved 25 tons of rock by truck a distance of several hundred yards.

So much for the physical labor involved.

THE THIRD DIMENSION—CULTURE

After all this work we find an amazing amount of materials and historical facts. First of all, we have the physical appearances and sizes of the rooms, the types of masonry and of floors, the plaster on the walls; various features such as firepits, storage pits, postholes, and doorways. Then we have the contents of the rooms—that is, the contents left behind by the last occupants and by time and weather—for almost all perishable items tend to disintegrate in an open site (open as opposed to a cave site) such as this which is exposed to the elements. But, surprisingly enough, some perishables remain, preserved partly and paradoxically by fire. That is, corn, beans, squash, sandals, cloth, and bits of matting were charred and thus preserved when the roof timbers burned. And finally we have the so-called "imperishables" such as pottery and tools of stone and bone. We have recovered a few pieces of whole pottery and many crushed pots, but these can be restored to their pristine shape and beauty by the skill of the Museum's ceramicist, John Pletinckx.

How do all these things help us in reconstruction of the life of these ancient people? What sort of story do these material remains tell? To the experienced eye of the archaeologist the stone and bone tools, the type of houses, and the kind of pottery all take on a new significance; being man-made they reflect the life of man.

First of all, we know that these people were primarily farmers. This we can deduce

from much evidence. We find the remains of charred corn, beans, and squash. We find many metates and manos with which they ground their corn meal, and storage baskets for hoarding the winter's supply of food. Arrowheads and other weapons of the chase and of warfare are significantly few. The size of the pueblo tells us that agriculture must have been important because such a large population as lived here

TOUGH BUT DELICATE JOB

The archaeologist must strain his muscles with pick and shovel, and then switch to the most delicate operations in excavating cultural relics. Here are shown final steps in removal from ground of embedded ancient cooking pot. The jar probably was used for storage because its mouth was flush with the floor of prehistoric Indian dwelling, while its body was under the floor.

could not have been supported on hunting, fishing, and gathering of nuts and berries. The flat margins of the San Francisco River probably afforded amply watered rich farmlands.

Any surplus of food or other materials was used in trade, perhaps for the Glycymeris shell from the Gulf of California that was used in making beautiful bracelets. Trade was also carried on with their northern neighbors, the Anasazi, to secure fine pottery vessels. A surplus of food also provided a comfortable buffer against bad years. The diet of vegetables was varied when the hunter brought home rabbits, squirrels, turkeys or an occasional deer or elk. On the floor of the rooms we find the bones of these animals still lying right where they were thrown after some prehistoric pueblo meal.

RAVAGES OF FIRE

Of course, this picture of economic well-being was often blighted by tragedy or near tragedy. Several of the rooms of this pueblo burned. In one of the rooms we found great stores of corn, and one can imagine the hungry winter that the occupants faced with their harvest consumed by the angry flames. There was no protection against fire, no fire-fighting equipment (and no fire insurance). The water of the river was too far away to be of much use, and even though the rooms were built of stone and mud, the wooden roofs and the corn itself must have blazed heartily.

Though fires were a tragic occurrence, they were not as tragic as premature death. Infant mortality was very high in this pueblo and the lifespan of the people was not very great. Buried under the floor of one of the rooms we found skeletons of five infants; in another room, there were three, most of them only a few days old when they died. The poor health conditions and the lack of medical knowledge undoubtedly accounted for the high incidence of infant deaths. Habits in these times were not very sanitary. Refuse apparently was carried just outside the door and dumped. Water for drinking and washing had to be carried several hundred yards, so that except for dips in the river, bathing was infrequent. Several people most likely ate from a common dish, and without doubt flies abounded everywhere.

With two of the infant burials we found grave offerings of whole pottery. This is a very rare occurrence with infants and probably bears testimony to the affection in which these children were held and the great loss that their parents felt. Another mark of affection, and to us perhaps a strange one, was the fact that the infants were buried under the mud floors of the rooms. Perhaps the parents were reluctant to have their dear ones very far from them.

EVIDENCE OF CEREMONIES

Magic and religion played a large part in the lives of these people, just as it does among many peoples throughout the world. Ceremonies were held in a room set aside for this purpose, and in this site we have found such a room. It is the largest room yet uncovered here and there are indications of extensive remodeling. Originally it was two rooms but when the need arose for a larger ceremonial room, a partition was torn out and a new floor put into the room. In this room we found a Corn Goddess symbol, which is a large sandstone block shaped to resemble an ear of corn. In an adjacent room we found a beautifully decorated sandstone slab painted in red, yellow, green, and black. These colors were sometimes used to represent the cardinal directions. Pottery was frequently placed in the graves with deceased adults either as an offering or for use in the spirit world. With the adult burials uncovered this year, we have found several such pieces of pottery.

Thus from the three-dimensional view comes a story of life and death, of plenty and hardship, of symbolism and stark reality.

Change in Visiting Hours

On September 8, the day after Labor Day, autumn visiting hours, 9 A.M. to 5 P.M., go into effect at the Museum, continuing until October 31.

'LOST WORLD'—

(Continued from page 4)

were eaten regularly by the Indians and myself. For my own luxuries I also had dried soups, dehydrated vegetables, dried fruits, and dehydrated beverages, powdered milk, malted milk powder, ovaltine, postum, cheese, and sardines. One can each of butter and peanut butter were saved as luxuries for special occasions. We relished feasting upon fresh meat, whenever it became available. Peccary (wild pig), tapir, capybara (*lapa*), caiman (a type of crocodile known as "*baba*"), curassow, wild turkey (*pava*) (different from our wild turkey of the United States), and wild mountain chicken (a species of guan) were frequently on our bill of fare.

The Indians, who normally live at the lower warmer elevations requiring a minimum of clothing, do not enjoy living in the relatively cooler upper levels where the expedition carried on most of its work. They had to be supplied extra blankets.

The expedition carried on its work during the rainy season, which lasts from April through October. The rains added to discomfitures experienced on the trip. Long hikes and steep climbs over difficult slippery trails were taken during heavy rains, and I would return at the end of the day with dirty wet clothing, and wet shoes.

At the end of the trip in July, the expedition left its main base camp on the Río Tirica for its return to the airport at Urimán along the Río Caroni. Four dugout canoes (called *curiares*), filled to capacity with the treasures of the expedition, were needed. During the trip home down the turbulent rushing flooded Río Tirica with its dangerous rapids, the canoes had to be guided very carefully by the Indians who were always alert for submerged rocks or logs. The slightest miscalculation would have foundered the canoes and dashed them against one of these hidden rocks, with loss of valuable specimens and equipment.

Although many botanical species new to science and a large number of genera and species new to the Museum's Herbarium were obtained, it is safe to state that but a small fraction of the total flora of this large mountain was obtained. Years and years of hard work, requiring numerous trails that would have to reach all parts of the summit and many sections of the mountain, are necessary before any real idea of the luxuriant and amazing flora of Chimantá-tepuí can be gained.

Daily Guide-Lectures

Free afternoon guide-lecture tours are offered daily except Sundays under the title "Highlights of the Exhibits." These tours are designed to give a general idea of the entire Museum and its scope of activities. They begin at 2 P.M., Monday through Friday, and at 2:30 P.M. on Saturday.

Motifs for 'Modernism' . . .

ART STUDENTS FIND IDEAS IN PRIMITIVE CREATIONS

By BARBARA POLIKOFF
BULLETIN STAFF WRITER

"Other educational institutions deal perforce with books and words. For that constant illustration of the idea by the fact which is indispensable to the communication of any ideas they must rely on the three-dimensional reality which can only be supplied by museums."

ROBERT MAYNARD HUTCHINS, in an address commemorating the 50th anniversary of Chicago Natural History Museum, 1943

IF THE STUDENTS of the Art Institute's course in primitive art had been present when Robert Maynard Hutchins spoke the above words, they would have

ART STUDY IN AFRICAN HALL

Whitney Halstead, instructor of the Art Institute primitive art course that set up camp in the Museum for six weeks this summer, discusses with two students some Nigerian gourd designs.

mentally applauded. For the exhibits of primitive cultures in Chicago Natural History Museum have rescued them from the disheartening necessity of trying to understand the art of primitive people by studying illustrations in books. The Museum has made the art of Benin, Angola, Nigeria, the Cameroons, come alive for them, and their work and enthusiasm are indicative of the contribution which anthropological collections make in facilitating the communication of knowledge from one culture to another and from one generation to the next.

The exhibits showing primitive culture are rich in art, not because an effort was made to collect art objects but because art is so inseparable from the daily life of primitive people. The baskets, religious masks, and ancestral figures that the anthropologist collects to illustrate certain facets of primitive society are very likely to be notable for artistic qualities as well. When, around the turn of the century, these qualities rather than the anthropological value of the objects began to impress artists from France and Germany, primitive art was said to have been "discovered." Now, due to the increasing frequency with which primitive art is discussed and illustrated, as well as the growing use of its design elements by interior decorators, more of the American public has begun to appreciate its aesthetic value and has ceased to regard it as merely bizarre and curious.

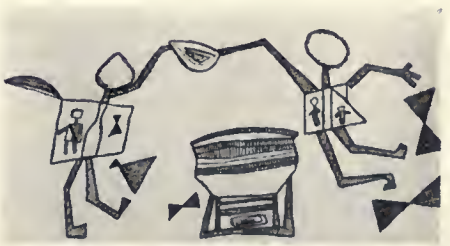
The class in primitive art which has set up camp at this Museum for six weeks during each of the past few summers is taught by Whitney Halstead, a former student of the Art Institute now working in our Department of Anthropology. In past summer sessions the course has dealt with the art of the South and North American Indians and of Oceania. The Oceanic art study was particularly rewarding because of the great wealth of Oceanic material in the Museum—members will recall that the Museum of Modern Art in New York drew heavily upon our Melanesian, Polynesian, and Micronesian exhibits in preparing its exhibit on the art of the South Seas, so much so that those familiar with our Oceanic halls would have felt very much at home at the

APPROACH TO SURREALISM

Movement has been conveyed by curving, a la Salvatore Dali, the legs of the running horse. This is a student drawing of a gold figure made by a member of the Ashanti tribe of the Gold Coast.

time in the Modern Art halls in New York. During the past summer the history of art course dealt with African art, and for six weeks students spent three hours a day four times a week studying and drawing objects in the African exhibits.

Mr. Halstead, whose study of primitive art stimulated him to study anthropology as well, was able in his weekly lectures to give his students an idea of the cultural significance behind some of the art objects, although the emphasis of the course did not lie here. The primary purpose was to consider the elements of art which the students had studied in previous courses—dot, line, dimension, color, texture—and to analyze the use of these elements by the primitive artist. Through their study the students were able to realize more fully how fallacious is the popular conception that primitive art is either crude or naive. They were particularly struck by the remarkable three-dimensional qualities of the art as well as by the artist's sensitivity to his material



'MODERN' LOOK IN PRIMITIVE ART

A student drawing of a section of line design that decorates a gourd from Angola. The design is similar in spirit to the line designs of the well-known modern artist, Paul Klee.

and the relationship he was able to achieve between that material and the form and expression of his work. It became impressively clear to them that primitive art, like all art, is the result of man's conscious attempts to create things of beauty.

One of the major aims of these Art Institute students is to understand the relationship between the art of one period and culture and the art of another. In studying

(*Continued on page 8, column 3*)

Programs Begin October 3 . . .

LECTURES AND MOVIES SET FOR ADULTS, CHILDREN

The two annual autumn series of Saturday programs, one for children and one for adults, will begin October 3 and continue on each of the nine Saturdays through October and November. The children's programs, mostly movies, are given by the James Nelson and Anna Louise Raymond Foundation. The course of lectures for adults, for which eminent scientists and explorers have been engaged, is presented under the provisions of the Edward E. Ayer Lecture Foundation Fund. All lectures will be illustrated with motion pictures in color. Both series of programs will be presented in the James Simpson Theatre of the Museum, the children's programs at 10:30 A.M. and the adult lectures at 2:30 P.M.

First of the adult lectures, on October 3, is "Pakistan," by Hal Linker.

No tickets are necessary for admission to these lectures. A section of the Theatre is reserved for Members of the Museum, each of whom is entitled to two reserved seats. Requests for these seats should be made in advance by telephone (WAbash 2-9410) or in writing, and seats will be held in the Member's name until 2:25 o'clock on the lecture day.

In the children's series the opening program on October 3 will feature the film "Arctic Borderlands."

FOSSIL STUDY IN EUROPE

Dr. Robert H. Denison, Curator of Fossil Fishes, left on August 24 to spend a year in Norway, Sweden, and Great Britain. He is on leave from the Museum to study early vertebrates under a Guggenheim Foundation fellowship. The necessity for this trip has resulted chiefly from an effort to make a representative collection of Silurian and Devonian vertebrates of North America for Chicago Natural History Museum. For a clearer understanding of the structure and relationships of these early fishes and prefishes, it is necessary to compare them with better-known European material. With this purpose in mind, Dr. Denison will study important collections from Spitsbergen, Norway, and Poland at the Paleontologisk Museum in Oslo and at the Naturhistoriska Riksmuseet in Stockholm, as well as extensive material from classic British Silurian and Devonian localities in the British Museum (Natural History) in London.

Curator Denison will also accumulate information regarding the occurrence of the earliest vertebrates in an attempt to throw more light on their habitat. This is a problem of considerable interest because it may suggest the environment in which vertebrates originated and give a clue to where to search for vertebrate ancestors. The habitat of a fossilized animal, however, is not always easily determined. It may be indicated by the structure or the nature of the sediment in which the fossil is entombed, or it may be suggested by the associated fossils and their manner of preservation.

STAFF NOTES

Henry S. Dybas, Associate Curator of Insects, is on a field trip to the northern Wisconsin shore of Lake Superior where he is seeking insects for the Museum study collections .... **Colin C. Sanborn**, Curator of Mammals, spent two weeks last month as a special consultant to the U. S. Public Health Service in a survey of bats in Florida .... **John R. Millar**, Deputy Director, appeared on WGN-TV August 19 as the Museum's representative to answer questions about the establishment and purposes of the proposed Channel 11 educational television station for Chicago .... **Miss Mary Sue Hopkins** has been appointed Secretary for the Department of Geology. She holds a bachelor's degree with a geology major from Bryn Mawr College. Before graduation she studied at Beirut, Lebanon, and at the School of Classical Studies in Athens, Greece .... **Dr. Karl P. Schmidt**, Chief Curator of Zoology, was designated as chairman of the United States delegation to the 14th International Zoological Congress that he attended at Copenhagen, August 5 to 12. The Museum was represented at the Congress also by **Mrs. Marion Grey**, Associate in the Division of Fishes, who participated in a symposium on deep-sea fishes .... **Loren P. Woods**, Curator of Fishes, was lecturer on the Sunday television program, "Live and Learn," presented by the Public Service Division of NBC over WNBQ on August 23 .... **George I. Quimby**, Curator of Exhibits in Anthropology, recently visited archaeological expeditions at Sheguiandah and Killarney in the Manitoulin district of Ontario .... **Miss Elaine Bluhm**, Assistant in Archaeology, has been spending weekends throughout the summer excavating prehistoric Indian artifacts and skeletons on a site in the forest preserve near Thornton, Illinois, just outside Chicago.

Honolulu Museum Officials Here

Yoshido Kondo, curator of non-marine mollusks at the Bernice P. Bishop Museum in Honolulu, recently spent two weeks studying Pacific land-shells in the collection at Chicago Natural History Museum. Donald Mitchell of the Kamehameha Schools in Hawaii, who directs the education program of the Bishop Museum, also was a recent visitor.

NEW MEMBERS

The following persons became Museum Members from July 16 to August 7:

Associate Members

Homer A. Burnell, W. Fred Dolke, Gillette A. Elvgren, Mrs. Henry S. Kahn, Felix Palm

Annual Members

Warren W. Brown, B. B. Brownell, R. M. Buchanan, David S. Chesrow, Charles C. Cooley, Tilden Cummings, William W. Darrow, S. F. Eagan, Mrs. A. D. Flynn, R. H. Gansbergen, James W. Gee, Albert E. Jenner, Jr., John L. Lehman, Mrs. R. S. Melville, Earle F. Opie, James T. Pettengell, Charles S. Potter, W. J. Reilly, Gerald A. Sivage, W. M. Slavik, H. Bowen Stair, Mario Tanzi, Lester W. Tarr, George Tiberius, J. W. Tillotson, Dr. Milton Tinsley, Bruno L. Travelletti, S. M. Vance, Dr. Leroy N. Vernon

Gifts to the Museum

Following is a list of the principal gifts received during the past month:

Department of Anthropology:

From John Ruiseco, Chicago—human head of basalt (Olmec style), Mexico

Department of Botany:

From: Holly Reed Bennett, Chicago—176 grasses and sedges, Indiana; Herbario Nacional Instituto de Biologia, Mexico City—8 Dioscorea, Mexico; U. S. National Museum, Washington, D.C.—10 seeds of Scrophulariaceae

Department of Geology:

From: the late J. H. Britts—collection of fossil invertebrates, various localities; Mrs. D. L. Casey, Yuma, Ariz.—skull and jaws of *Epeorodon occidentalis*, Oregon; Donald M. Johnson, Jefferson City, Mo.—2 plaster casts of fossil mammal teeth

Department of Zoology:

From: John T. Helton, Troy, Ala.—a snake, Alabama; Harry Hoogstraal, Cairo, Egypt—100 Hippiboscids (bird-louse flies), Egypt; J. E. Johnson, Jr., Waco, Tex.—3 snakes, Texas; N. L. H. Krauss, Honolulu, Hawaii—12 frogs and a snake, Trinidad and Cuba; Dr. Orlando Park, Evanston, Ill.—3,595 insects, Maricopa Co., Ariz.; Dr. Janis A. Roze, Caracas, Venezuela—a frog and 3 snakes, Venezuela; Dr. J. Slater, Ames, Iowa—5 bugs (including two paratypes of 2 species); Lt. Col. Robert Traub, Washington, D.C.—22 slides of fleas, 2 paratypes and a holotype, Africa, Borneo, Korea, Siam and Mexico; U. S. Fish and Wildlife Service, Pascagoula, Miss.—21 lots of fishes, Gulf of Mexico; Dr. Fred R. Cagle, New Orleans—6 turtles (paratypes), Alabama and Mississippi; W. E. Kelley, Elyria, Ohio—collection of cave crayfish, Indiana; K. Matsubara, Kyoto, Japan, 7 fishes, Japan; Dr. Fred Medem, Chicago—80 crocodilian skulls, Colombia; T. Pain, London—collection of fresh-water shells, Mexico

Library:

From: Peder A Christensen, Cleveland

ART STUDENTS—

(Continued from page 7)

the African exhibits they found the relation of modern art to primitive art strikingly illustrated by certain of the Museum exhibit pieces. The line drawing (see illustration) which appears on an African gourd, for example, is remarkably similar in spirit to the line drawings of Paul Klee, noted modernist. This kinship is probably due to the use of primitive art ideas by Klee and other modern artists who have constantly sought for and experimented with new forms of artistic expression.

The primitive culture exhibits of this Museum have proved a mine of ideas for the Art Institute students as well as for their more famous predecessors. In analyzing the use of artistic elements which characterized the different African art works, they have derived ideas which they can use in their own artistic endeavors. The line designs on the gourds have become particular favorites, and at least one student is planning to do enamel work using ideas derived from the gourd designs.

Thus, the Museum exhibits not only enable students and other interested persons to understand primitive art, but they serve as an impetus to the creation of art yet unborn. And if it is true, as one student remarked, that the more they draw the more they see, visitors who walk through the African halls will continue to encounter intent young artists carefully sketching "new" treasures discovered in some hitherto unexplored niche of the African Hall exhibit cases.

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Chicago Natural History Museum

Chicago Natural History Museum

FOUNDED BY MARSHALL FIELD, 1893

Roosevelt Road and Lake Shore Drive, Chicago 5

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Members are requested to inform the Museum promptly of changes of address.

YOU ARE INVITED—

OCTOBER, traditional harvest month on the farm, brings many events for the city dweller, too—a resurgence of business and political activities, the beginning of Christmas shopping excitement, new plays in the theatre and new books off the press, Chicago Fire Day (October 9), the anniversary of Columbus' discovery of America (October 12), Halloween parties—and MUSEUM MEMBERS' NIGHT. This year the date on which the Museum will act as host to its membership is Monday evening, October 5.

All Members of the Museum are urged to attend this "open-house" reception and to bring guests. On hand to greet them will be President Stanley Field, Director Clifford C. Gregg, the Chief Curators and divisional curators in the Departments of Anthropology, Botany, Geology, and Zoology, and artists, taxidermists, preparators, librarians, photographers, the staffs of the two school work-units (Harris Extension and Raymond Foundation), editors, printers, and personnel of other divisions. Groups of Members and their guests may join tours conducted by the seven young women of the Raymond Foundation lecture staff, or they may wander through the building independently. Visitors will be welcomed on the third and fourth floors, ordinarily barred to the public, where the doors of offices, laboratories, and workshops will be opened to them, and members of the staff will demonstrate techniques of the many unique and specialized tasks they perform. (*See article on page 3.*)

In Stanley Field Hall will be a special exhibit of flower prints, an account of which appears on page 5.

The Museum appreciates what you, as Members, are doing to support its scientific and educational activities. It is hoped that on this night you will come in throngs to renew your acquaintance with the many functions that the Museum is performing, the methods by which its activities are carried on, and the members of its staff.

MEMBERS' NIGHT

PROGRAM

Monday, October 5

7 p.m. to 10:30 p.m.

(*Museum doors open at 6 p.m.*)

FOR YOUR CONVENIENCE—

Special Motor-Bus Service has been arranged for Museum Members and guests. Bus will leave Jackson Boulevard at State Street at 15-minute intervals beginning at **6:30 p.m.** Returning, last bus will leave Museum at **10:45 p.m.** Transportation is free—no fares, no transfers. The bus will stop at 7th Street and Michigan Avenue on each trip to and from the Museum.

You May Dine at the Museum in the Cafeteria (ground floor). **Open 6 to 8 p.m.** (regular service and prices).

FOR YOUR ENTERTAINMENT—

Special Exhibit: Flower Prints (1798–1807)—Stanley Field Hall (first floor). A set of 32 magnificent color-plates from Thornton's *Temple of Flora*. The exhibit is a loan to the Museum from Walter S. Ross of Chicago. Supplementary display of books from Museum Library shows development of techniques in botanical illustration from centuries ago down to modern color-plates.

Open House: "Behind the Scenes," 7 to 10:30 p.m. Visitors are invited to take elevator to third and fourth floors where the scientific staff and other Museum workers will welcome them in laboratories, studios, offices, and the Library and explain various phases of a museum's operation.

THIS MONTH'S COVER

The allegorical frontispiece from "Hortus Cliffortianus," by Carolus Linnaeus, published in 1737 in Amsterdam, is reproduced on our cover. George Cliffort, then mayor of Amsterdam, was the proud owner of the richest garden of his time. He employed the famous Swedish botanist Linnaeus for several years to study the exotic plants found in this garden, including a flowering specimen of banana. The results were published in Linnaeus' folio. The illustrations in this book, like those in many of the period, are reproductions of copper engravings. Noteworthy in the foreground is one of the earliest illustrations of a thermometer showing centigrades, an instrument invented by Linnaeus' countryman and contemporary, Celsius.

Nature Photo Exhibit Coming; Early Entries Are Urged

An early call has been issued for entries in the Ninth Chicago International Exhibition of Nature Photography to be held at the Museum February 1 to 28, inclusive, under the joint auspices of the Nature Camera Club of Chicago and the Museum. Both amateur and professional photographers are invited to compete. To be considered, photographs must fit into one of the divisions specified: Animal Life, Plant Life, or General (scenic, geological formations, etc.) Detailed information may be obtained on the official entry forms, available on request from the Museum. The judging will be done by a group of photographers and naturalists. Final deadline for entries will be January 16. The photographs should be sent direct to the Museum. Color slides and prints, as well as black-and-white photographs, are eligible. Silver medals and ribbons will be awarded to winners in various print and slide classifications.

Gifts to the Museum

Following is a list of the principal gifts received during the past month:

Department of Anthropology:

From: Adm. Royal Eason Ingersoll, La-Porte, Ind.—Chimu whistling jar, Peru; Mrs. Albert MacRae, Glencoe, Ill.—Navaho saddle blanket, southwest United States

Department of Botany:

From: Karl Bartell, Blue Island, Ill.—9 phanerogams, Illinois and Indiana; California Academy of Sciences, San Francisco—*Juliania adstringens*, Costa Rica; Irene Cull, Peoria, Ill.—4 *Camassia*, Illinois

Members' Night, Monday, October 5 . . .

OPEN-HOUSE GUESTS WILL LEARN MUSEUM'S 'INSIDE STORY'

By BARBARA POLIKOFF
BULLETIN STAFF WRITER

"He's an icthyologist at Chicago Natural History Museum."

"I know, but what does he do?" . . .

Laymen can usually summon to mind some picture of the work done by engineers, doctors, or accountants. But to most laymen the work of the museum geologist or artist-preparator is a subject clothed in deepest mystery. The mystery is not a product of desire or design but results from the fact that the work of museum scientists and artist-preparators affords them little chance to meet with the public. Members' Night offers such an opportunity. The doors to workshops and laboratories will be open and Members are invited to explore their recesses armed with questions that they can ask the staff about the inner workings of the Museum.

TRIAL RUN

Emil Sella temporarily fits model cones of the Welwitschia, a unique African plant, before it was finally assembled in the Hall of Plant life.

BEHIND THE SCIENTIFIC SCENE

The daily activities of the scientists in the four departments of the Museum—Anthropology, Botany, Geology, and Zoology—run the gamut, from writing articles for publication to advising an anxious hamburger-stand proprietor how to encourage skunks to move on to other more appropriate quarters. But whatever the day or week, an important task of each curator is the building up and preserving of the department's study collections. These collections of reptiles, insects, minerals, plants, artifacts, etc., can be seen on Members' Night. They represent the work completed so far in collecting, identifying, and classifying specimens from all corners of the world. It is this part of the scientists' work in establishing a uniform identification and classification system that makes possible a continuity of knowledge about the natural world from one generation to the next and from one place to another, so that the specimen labeled "x" in an American museum in 1953 will be the same type as the one labeled "x" in a French museum a century later.

Depending upon which division of the Museum he visits, the Member will see different methods of preserving and storing specimens. For example, the zoologist has a problem in preservation of specimens different from that of the geologist, who has no worry about preserving minerals that have survived the passage of thousands, often millions of years. The men in the insect division have to cope with an ironic difficulty, that of preserving some insect specimens from the destructive appetites of vagabond insects that occasionally gain illegal entry into their storage cabinets.

It's a house of vast dimensions that's being opened Members' Night, October 5, for "behind-the-scenes" tours. This article gives a brief review of some of the Museum laboratory and workshop activities so that Members may choose which scenes they would especially like to "get behind."

The ways in which scientists collect specimens form a facet of museum activity of which laymen seldom hear. The expedition to Africa to hunt an elephant or two has been publicized by adventure stories, but there are many field expeditions that receive no such glamorous buildup. The curators themselves are probably the only source of information on these little-known methods. Henry S. Dybas, Associate Curator of Insects, claims, for instance, that in order to hunt minute insects out of their rather unorthodox (in human terms) dwellings, from beaver ears to cereal boxes, an inspired insect collector must himself be able to adopt insect psychology so that he can understand what, for an insect, would be a nice, prosperous neighborhood in which to live. The Museum Member who finds himself unable to manage this metamorphosis is encouraged to speak to Associate Curator Dybas.

Members will find that the scientific staff will be as readily accessible as the collections and will welcome the chance to answer any questions about the activities of their departments. After spending some time with the curators, who often shy away from the title of expert, Members are likely to feel as a visitor to a foreign museum did when the world-authority on a certain field exclaimed, "I really know very little about my subject." The visitor replied, "Well, I wish I knew as little as you do."

BEHIND THE WORKSHOP SCENE

While the scientists study nature, the artists and preparators reproduce, restore, and reconstruct it. The greatest tribute to their work is when their part in an exhibit goes unnoticed—when the orchid or the sea otter is so life-like that the observer isn't aware that the hand of man played a part in their construction. The smallest acorns on the ground in the Pomo Indian diorama and the familiar giant elephants in Stanley Field Hall are the result of skills learned through years of trial and error, experimentation, and "perfectation."

A BABY IS 'BORN'

Leon L. Walters nears the end of his work in bringing a baby hippopotamus to "life" in the taxidermy workshop, using process he invented.

As Alfred Lee Rowell, the dioramist of the Department of Anthropology, has said, it is often not so much a matter of what you know but what you can figure out when confronted with a new exhibit to prepare. Dioramist Rowell is now working on some tiny baskets for a new diorama and is using a technique that he has just about perfected—wrapping cord around a clay form and then coating it with celluloid laquer. Not only does he often have to determine how to make things but what to make them from, keeping in mind that the spear, dress, or tree that he makes must last indefinitely, retaining its shape and color. In his search for new and durable material he once called a rubber company to inquire about one of their new products. "Will it last?" he asked the salesman. "Oh, yes," came the confident reply. "We have something made from it that is over five years old!" The salesman couldn't understand why Lee Rowell was unimpressed.

In the Plant Reproduction Laboratories of the Department of Botany some of the most

exacting hand-work is done in fashioning leaves, flowers, buds, etc. The children who wonder who has the job of watering so many plants would be surprised to discover that some of the flowers and buds are of glass, blown into their delicate shapes by Emil Sella, Curator of Exhibits. The Museum Member who visits the plant reproduction workshops will see different leaves

A 'FITTING' TASK

In the paleontology workshop William D. Turnbull pieces together the leg of a fossil reptile that lived about 200 million years ago.

in various stages of completion, and the men of the department will be glad to explain the life-cycle of the workshop leaf or flower. Members may also discover that "plant men" often turn inventor and design and construct their own tools. A rather historic workshop invention that might interest thwarted lawn growers is a grass-making machine that very expertly turns out slim green tendrils that might even deceive Mother Nature.

The Taxidermy Division always has mammals, birds, and reptiles that are in various stages of preparation, looking toward the day of their debut in exhibition cases. Museum Members will often be surprised to learn of the myriad processes required to make birds and animals that were once alive seem alive again. In taxidermy, too, many techniques are used, some of which originated with the men in the department, such as Leon L. Walters' method of reproducing reptiles by means of plastic poured in plaster molds.

In the workshop of Joseph B. Krstolich Members will see the birthplace of plastic models that are used in many well-known exhibits, such as the exhibit illustrating the mammal family tree. Artist Krstolich often sees life through both ends of the microscope. He carves enlarged models of microscopic specimens and small models of very large animals. The technique of carving plastic requires its own special skill and his knowledge of sculpturing helps Krstolich to make lifelike models of horses, kangaroos, or any other member of the animal kingdom with fine attention to anatomical accuracy.

In the Paleontology shops, work of a different nature goes on. Here the gigantic skeletons of dinosaurs are pieced together. Often a bone is missing, and Preparator Stanley Kuczek has to make one to fit. The Department of Geology has other workshops and a chemical laboratory for the preparation and study of minerals and other materials of economic importance. Robert K. Wyant, Curator of Economic Geology, and Harry E. Changnon, Curator of Exhibits, and their assistants do many unusual things such as slicing meteorites on machine saws to study microscopically the "etchings" that remain on a flat surface. Here also are created exhibits demonstrating facts about atomic energy, the interior of the earth, volcanoes, the solar system and other subjects hard to comprehend without visual aids.

In some instances the artist's task is not to reproduce but to restore. John Pletinckx, Ceramic Restorer, is such a person. When archaeologists find the remnants of a bowl either in one piece or several pieces, Pletinckx builds a bowl around the original piece, if there is only one, or manages to fit the many pieces together, if there happen to be several. In either case an authentic bowl is the result, a delicate and skillful job that many housewives who have sentimentally kept pieces from their favorite dishes lying in drawers would like to learn to do.

THE FINISHING TOUCH

The hands of Alfred Lee Rowell, Dioramist, are accustomed to working on miniature objects. These tiny bowls will look right at home in a diorama that is being made to show how prehistoric Indians lived in a village excavated by the Southwest Archaeological Expedition.

After visiting the workshops it is enlightening to take another look at some of the exhibits in the Museum. Members may find that their new acquaintance with some of the workshop techniques does not destroy the exhibit's effect of reality but encourages them to notice many details that they had previously overlooked. They may also find that they leave the Museum with a new appreciation for the work done by scientists and artist-preparators to further man in his age-old search for understanding of himself and his world.

It should be pointed out here that this article makes no pretense at being a complete survey. The men who are mentioned by name number only nine, and are cited merely as examples—on the third and fourth floors about eight times that many other men and women are engaged in equally unique and important tasks; and the personnel required to operate all functions of the Museum and maintain its building and contents numbers well above 100 other persons.

MUSEUM MEMBERS' NIGHT
Monday, October 5

Women's Role in Museum

In recent years women have played an increasing part in the activities of the Museum. Among a total personnel of 217 (including scientific departments, Library, educational work, business offices, maintenance, and all other divisions) 63 employees are now women. In the 1890's when the Museum was founded, there were few women. A recent addition is Miss Maidi Wiebe, Artist in the Department of Geology.

New Members

The following persons became Museum Members from August 10 to September 11:

Associate Members

Mrs. Laurance Armour, Mrs. John Jay Borland II, William G. Caples, Adrian O. Holmberg, Benjamin Keach, Dr. H. M. Serota, David F. Swain, Thomas S. Tyler, Albert G. Wade II

Annual Members

D. H. Burrell III, Herbert K. Butz, Mrs. Samuel S. Byron, Kendall Cady, Charles J. Chapman, Charles A. Colbert, Anthony J. DeTolve, Dr. George DeTrana, Alexander Dewey, Dr. Robert D. Dooley, Vernon K. Evans, Edgar A. Flynn, Louis H. Goebel, Joseph Hearst, Jacob Inger, R. A. Jucknies, J. H. Kennedy, Ellis R. Lewis, Arnold Newberger, Russell L. Peters, Max K. Ruppert, Joseph S. Sample, Dr. Edward C. Smith, Warren C. Swett, Dr. Harold W. Thatcher, J. Dean Vail, Jr., Dr. Joseph E. Verhaag, Mrs. Isabel B. Wasson

Etruscan antiquities from the 8th to 2nd centuries B.C. are displayed in Edward E. and Emma B. Ayer Hall (Hall 2).

Museum Members' Night, Monday, October 5 . . .

SPECIAL EXHIBIT: 'TEMPLE OF FLORA,' MOST FAMOUS OF ALL FLORILEGIA

The featured special exhibit for Members' Night, Monday, October 5, will be a set of 32 magnificent colored folio prints of flowers. They were published between 1798 and 1807 in London by a noted English physician and botanist, Robert J. Thornton, under the title *The Temple of Flora*. The plates have been lent to the Museum by their owner, Walter S. Ross of Chicago, a Member of the Museum. Museum Members will be the first to view this exhibit, but it will be continued until October 31 for the general public.

A supplementary display of some thirty books from the Museum Library shows the development of techniques of botanical illustration from simple woodcuts in old herbals to modern color-plates. It was prepared by Miss Edith Vincent of the Department of Botany.

By THEODOR JUST
CHIEF CURATOR, DEPARTMENT OF BOTANY

ALTHOUGH the botanical literature of the past three hundred years is replete with books containing beautiful illustrations of plants, none is as famous as Thornton's *Temple of Flora*. Its extravagant conception and artistic execution brought everlasting fame and financial ruin to its author. Today original copies of this extremely rare book may be sold for more than $1,500, while individual plates are variously priced.

16th CENTURY WOODCUT

Illustration showing a folk dance around the Linden tree. From the early German herbal by Hieronymus Bock (Tragus), published in Strasbourg in 1553.

What then makes a work published between 1799 and 1807 command such a price?

The author, Robert John Thornton (1768?–1837), was a practicing physician in London and lecturer in botany at Guy's Hospital. In the latter capacity Thornton wrote a number of illustrated books on botany, none comparing in size and fame with his *New Illustration of the Sexual System of Linnaeus*. The third part of this pretentious work was issued separately under the title *The Temple of Flora*. It consists of 28 magnificent color-plates of various British plants and "exoticks," preceded by several portraits, allegorical scenes, and other plates. As these plates were issued at irregular intervals and Thornton frequently changed the plates and sent different prints to different subscribers, careful comparison may never disclose two identical sets. This fact and the exquisite art work are the real reasons for their great cost.

PLATES BY FAMED ARTISTS

While most of the plates were made by outstanding artists of that time and then transferred to copper by more than a dozen distinguished engravers, Thornton himself made the most famous plate of all, ROSES. Unlike earlier illustrated books on plants, the author requested his artists to show plants against their natural setting rather than with a plain background. Thornton's own "Explanation of the Picturesque Plates" adds much to the character of the book, as can be gleaned from the following passage (with scientific names of the plants inserted in brackets):

"Each scenery is appropriated to the subject. Thus in the night-blooming CEREUS you have the moon playing on the dimpled water, and the turret-clock points XII, the hour at night when this flower is in its full expanse. In the large-flowering MIMOSA [*Calliandra grandiflora*], first discovered on the mountains of Jamaica, you have the humming birds of that country, and one of the aborigines struck with astonishment at the peculiarities of the plant. In the Canada LILY there is expressed the shade it delights in, with a sky whose clouds yet contain snow within their bosom. In the narrow-leaved KALMIA, which comes forth under the same zone, but at an earlier season, the mountains are still covered with their fleecy mantle. The nodding RENEALMIA [*Alpinia speciosa*], on the contrary, has a warm sky, and cocoa-nut trees skirt the distant scenery. The AURICULA is represented as flourishing on Alpine mountains, when the utility of their banner becomes conspicuous. In the DODECATHEON, or American COWSLIP [*Dodecatheon media*] a sea view is given, and a vessel bearing a flag of that country: the same is shewn by a butterfly in the plates of the oblique-leaved BEGONIA; and the Pontic RHODODENDRON. In the Chinese LIMODORON [*Phaius tankervilliae*], and the Indian CANNA, are represented the pagodas of the East. The TULIPS and HYACINTHS are placed in Holland, where these flowers are particularly cultivated, embellishing a level country. The ALOE erects, in contrast, its stately form among mountains, and the height and shape of the whole plant may be seen in the background. In the maggot-bearing STAPELIA you will find represented a green African snake, and a blow-fly in the act of depositing her eggs in the flower, with the maggots produced from this cause. The clouds are disturbed, and every thing looks wild and sombre about the dragon ARUM, a plant equally poisonous as foetid. In the white LILY, where a dark background was obliged to be introduced to relieve the flower, there is a break, presenting to the view a temple, the only kind of architecture that can be admitted in a garden. Hence the several species of PASSION-FLOWERS are seen clambering up pillars, reaching to different heights. As each of these beauties of the vegetable race are carefully dissected, it is hoped, that the rigid botanist will excuse the author, who, striving at universal approbation, has thus indeavoured to unite the 'Utile Dulci.'"

EARLY COPPER ENGRAVING

Uppee part of a plate published in "Hortus Cliffortianus," by Carolus Linnaeus, Amsterdam, 1737. The plant shown is Turnera ulmifolia, found in the West Indies and Central America and distinguished chiefly by its yellow flowers.

LOTTERY FINANCING FAILS

In view of the great cost involved in the production of this work, Thornton soon found himself in financial distress and obliged to stop publication with less than half of the projected 70 plates. Authorized by an act of Parliament, he staged a botanical lottery in 1811 in the hope of restoring himself financially. Advertised in terms befitting 20th century auctioneering, the Royal

(*Continued on page 8, column 3*)

CAMOUFLAGE FOR DEFENSE IN THE BIRD WORLD

By AUSTIN L. RAND
CURATOR OF BIRDS

AN EXHIBIT in Boardman Conover Hall (Hall 21) deals with the manner in which color and pattern are useful to birds in concealing them from their enemies and from their prey.

The first point brought out in the exhibit is that the color we see is only partly the result of the color of the object at which we are looking; it is influenced by lighting. Two triangular blocks, each having one face painted white and one blue-gray, illustrate this. The block with the blue-gray side to the light and the white in darkness appears almost uniform in color; the block with the white to the light and the blue-gray in shadow appears sharply black and white.

This use of a pale color to eliminate shadows and make objects less conspicuous is called counter-shading and is shown by models. One model is uniform in color, but it appears dark below from shadow and is conspicuous. The central model, with the shadowed part painted pale, appears uniform in color and is less conspicuous. To demonstrate that this is really because of the distribution of the colors, a model, painted like the central one, is inverted, with the result that it is glaringly conspicuous and stands out boldly from the background.

A boldly patterned object may be relatively inconspicuous against a patterned background where a plain-colored object is more easily seen. Models illustrate this, but it is even more effectively portrayed by the group of three little killdeer crouched amongst the pebbles. The killdeer partly standing is easily seen, but it takes sharp scrutiny to make out the others.

The pattern of the background of dead leaves and grass is sometimes reproduced in the plumage of a ground-inhabiting bird. The bird's back is in effect a picture of the background. A brooding bob-white quail is used to show how well the bird and its environment blend together to conceal the bird.

COLOR FOR PROTECTION
With birds, shape and pattern, as well as color, aid in concealment.

Shape as well as color may be an aid in concealment. The exhibit shows the least bittern standing upright amongst some reeds. Not only do its colors match those of the reeds against which it is seen but its slender neck and long pointed bill also mimic the very shape of the reeds, adding to the effectiveness of the camouflage. The screech owl, sitting on the lower of two broken-off stubs, repeats the gray and black pattern of the stubs on its breast. But further, the shape of the owl in its upright pose makes it appear but a continuation of the stub, and its ear tufts simulate the jagged broken-off end of the stub.

Not all colors are adaptive, of course. Apparently some birds that live in forests amongst the leaves and branches where they gather their food of insects or fruit are sufficiently protected from their enemies by the nature of their environment and have no need of concealment in seeking their food. Birds such as these may have bright colors in their plumage, and the tanagers, represented in our exhibit by the scarlet tanager, are good examples of this. Many wary birds of the open country do not need concealing color. Their habits and their ability to look after themselves are such that concealing coloration would be of no importance, and the magpie shown in our exhibit is an example.

There are other uses of color in the bird world—in courtship displays to the female and as threat and intimidation displays in fighting—but these are reserved for later treatment in another exhibit. This exhibit was planned in the Division of Birds and executed by Assistant Taxidermist Carl W. Cotton, with the aid of Leon R. Aboulafia, special student from Tel Aviv, Israel.

ALBERT H. WETTEN
1869–1953

Through the death on September 3 of Albert H. Wetten the Museum has lost a distinguished member of its Board of Trustees and an enthusiastic supporter of the institution's endeavors for public service and the advancement of science. Mr. Wetten, who had reached the age of 84, first became associated with the Museum in 1926 as an Associate Member. He was elected to the Board of Trustees in 1939 and simultaneously became a Corporate Member. Mr. Wetten as a member of the Board devoted his time, thought, and energy lavishly to the interests of the Museum. From 1942 until his death he was chairman of the important Building Committee. He was also a member of the Executive Committee and the Finance Committee from 1945 on. In 1948, in recognition of his generous gift that made possible the color plates for the Museum publication by Dr. Ch'eng-chao Liu, *Amphibians of Western China*, Mr. Wetten's name was inscribed in perpetuity on the roll of Contributors.

Albert H. Wetten

Mr. Wetten was well known for other civic activities and for a notable career in Chicago business circles where he was a leader in the real-estate field.

Daily Guide-Lectures

Free guide-lecture tours are offered at 2 P.M. daily except Sundays under the title "Highlights of the Exhibits." These tours are designed to give a general idea of the entire Museum and its scope of activities.

Special tours on subjects within the range of the Museum exhibits are available Mondays through Fridays for parties of ten or more persons. Requests for such service must be made at least one week in advance.

Although there are no tours on Sundays, the Museum is open to visitors as usual.

SATURDAY AFTERNOON LECTURES OCT. 3 TO NOV. 28; FAR PLACES IN COLOR

AGAIN YOU MAY TRAVEL while staying at home—by attending the Saturday afternoon lectures illustrated with color motion-pictures presented by the Museum for its Members, their guests, and the general public. The Autumn Course will open on October 3 and will continue on each Saturday afternoon throughout October and November. The lectures, which are provided by the Edward E. Ayer Lecture Foundation Fund, are given in the James Simpson Theatre of the Museum at 2:30 P.M. Because of limited accommodations, admission is restricted to adults. For children, special free motion-picture programs are given in the Theatre on the mornings of the same Saturdays under the auspices of the Raymond Foundation.

Following are dates, titles, and lecturers in this season's series for adults:

October 3—PAKISTAN

Hal Linker

Comparatively little is known by the average American about Pakistan; yet among nations it has the fifth largest population and is the largest of all Mosiem countries. Mr. Linker, of Los Angeles, who has had a distinguished career in the U. S. Navy and other government service and in the production of documentary films, covers for the first time both East and West Pakistan. His pictures blend drama, color, and romance. Among especially beautiful or interesting sequences are those that show the bustling city of Karachi, the Shalimar Gardens in Lahore, the fierce tribesmen performing the spectacular Khattuck dances at Peshawar, and the beginning of the monsoons with which nature scourges the area.

October 10—MAGIC HAITI

Peter Alt

The color, charm, and beauty of Haiti will be brought to the Museum audience visually and audibly in the film and informal narrative of Mr. Alt, camera design-engineer and world traveler of Pittsford, New York. His pictures and story tell of water skiing, spear fishing, flower parades, Haitian beauties, celebration of the Mardi Gras, voodoo drums, folk dancing, life in the capital city of Port-au-Prince, and banana, sugar-cane, mahogany, sisal, and coffee plantations of the West Indian island.

October 17—ALPHABET OF THE OUTDOORS

Dick Bird

This is the newest motion picture and lecture by Mr. Bird, well-known naturalist of Regina, Saskatchewan, Canada. In it he presents a pageant of outdoor life. Birds, mammals, insects, reptiles, fishes, and plants, linked together with interesting transition techniques, are shown in their natural habitats in Canada, the United States, Mexico, the Caribbean, and Central and South America.

October 24—INDIA TODAY

Lieutenant Colonel Arnold Maahs

India is a land of crucial importance at this moment. Colonel Maahs of Tilleda, Wisconsin, a trained sociologist, author, and professional photographer, who is eminently qualified to interpret the mystic Asian land, spent many months and traveled thousands of miles as an observer in India recording what he saw and heard in color films and notebooks. His pictures and story present a panorama of everyday life in this giant nation under its recently acquired independence and are designed to give Americans a new understanding and appreciation of India.

RESERVED SEATS FOR MEMBERS

No tickets are necessary for admission to these lectures. A section of the Theatre is allocated to Members of the Museum, each of whom is entitled to two reserved seats. Requests for these seats should be made in advance by telephone (WAbash 2-9410) or in writing, and seats will be held in the Member's name until 2:25 o'clock on the lecture day.

October 31—COLOMBIA CAVALCADE

Aubert Lavastida

Colombia is one of South America's least-known but most fascinating countries, says Mr. Lavastida, now of Ann Arbor, Michigan, who has family ties with Latin America. In his color films and lecture he will take the audience over thousands of miles of varied terrain. After the desolate desert of LaGuajiro, inhabited by primitive Indians, Lavastida focuses his camera on the beauty of the Caribbean shore. He roves from Santa Marta, oldest city in South America, to the 18,000-foot Sierra Nevada peaks of the Andes; from the home of the hero Simon Bolivar, to jungles, seaports, remains of prehistoric cultures, the Magdalena River, and finally Bogotá, great modern city and capital of the country.

November 7—ICELAND, CAPRI OF THE NORTH

Robert Davis

One of the most misunderstood and seldom-visited countries in the world is Iceland, far up on the North Atlantic just below the Arctic Circle. Mr. Davis, photographer, traveler, and lecturer, of Kansas City, Missouri, seeks to remedy this with a story and color motion-picture record of the remote land, its people, and their customs and industries. There are visits to great glaciers, an active volcano, and geysers. Exciting is a sequence showing the hunting and harpooning of 30-ton fin whales. Spectacular waterfalls, enormous ranches with thousands of sheep, the important herring fisheries, and the modern capital city of Reykjavik contribute to the interest of the travelogue.

MUSEUM MEMBERS' NIGHT
Monday, October 5

November 14—THE HAWAIIAN ISLANDS

Yew Char

Mr. Char's home is in Honolulu, and Hawaii is his native land. His color films and story reveal his love for a Pacific paradise that nearly everyone else also loves. There are many unique features—Hawaiian cowboys are seen roping cattle in the sea, for example. Film and lecture present the colorful life of the 500,000 multi-racial people of the islands. There are pageants, interpretive dances, and thrilling scenes. The brilliance of the island landscape is captured—its garden atmosphere with exotic flowers blooming in profusion the year around and trees in complete bloom.

November 21—ATOMS AND ATOLLS

Colonel John Craig

"An Adventure Into Time" is the subtitle of this lecture and motion picture, and few subjects could be more timely. Colonel Craig, who comes from Arcadia, California, was in charge of the Air Force Motion Picture Unit that flew and photographed the Bikini atom-bomb tests. His films include also the most recent Atomic Energy Commission releases of pictures from the Eniwetok atomic tests. But Craig's story is not solely on atomic subjects. He shows also South Seas adventures, native life, and remarkable underwater scenes.

November 28—SEVEN WONDERS OF THE WEST

Francis R. Line

Mr. Line, who lives in Pasadena, California (when he is there), began at the age of eleven a career of traveling that has earned for him the sobriquet of "the one-man expedition." His present film and lecture are the result of a decision to set out with his family in a station wagon and explore the West anew, assessing its grandeur to select its seven greatest wonders. The resulting film shows two dozen wonder spots, and only at the end does Line reveal what he and his family voted as the seven they rank highest. He then asks his audience to vote their own selections.

Lecturers of the Raymond Foundation staff will guide parties of visitors on behind-the-scenes tours of the Museum on Members' Night, October 5.

ILLINOIS AUDUBON SOCIETY PRESENTS SCREEN-TOURS

The Illinois Audubon Society has announced three free "screen-tours" to be presented in the James Simpson Theatre of the Museum. The first, scheduled for Sunday afternoon, November 1, at 2:30, offers Allan Cruickshank, well-known photographer-lecturer who will present "Santa Lucia Sea Cliffs." Mr. Cruickshank's color films cover scenic grandeurs in the 100-mile area from Morro Bay to Monterey in California and bring intimate visits to many birds and other animals, including bald and golden eagles, peregrine falcons, Arctic loons, California murres, long-billed curlews, sea lions, and sea otters.

The other film-lectures are: January 17, "Land of the Scarlet Macaw," by Ernest P. Edwards, and March 14, "America the Beautiful," by Tom and Arlene Hadley.

Admission to these lectures is free, and the public is invited. Members of the Museum or of the Illinois Audubon Society are entitled to seats in the reserved section of the theatre upon presentation of their membership cards to the ushers.

STAFF NOTES

George Woodward, Captain of the Guard at the Museum, whose gracious greetings at the Museum entrance had become familiar to many Chicagoans who frequently visit the Museum as well as to employees who saw him every day, retired on pension September 30. Mr. Woodward, who was born in England, joined the Museum guard force in 1939 and was promoted to Captain in 1950. For years before coming to the Museum he was employed by the late Martin L. Ryerson . . . **Colonel Clifford C. Gregg,** Director, as featured speaker on September 6 on "Live and Learn," public-service television program of Station WNBQ, demonstrated with specimens some of the things the Museum does, and outlined its scope and purposes. The program was one of a current series on Chicago museums . . . . **Dr. Theodor Just,** Chief Curator of Botany, attended the annual meetings last month of the American Institute of Biological Sciences at Madison, Wisconsin, where he presided at a symposium on taxonomy, ecology, and stratigraphy of Tertiary angiosperms sponsored by the Paleobotanical and Systematic Sections of the Botanical Society of America, co-sponsored by the Society for the Study of Evolution. Before the American Society of Plant Taxonomists he made a report on the work of the committee on generic synopses, of which he is chairman . . . . **Bryan Patterson,** Curator of Fossil Mammals, who has returned from a field trip in western Colorado, attended the conference of the Society of Vertebrate Paleontology in Uinta Basin and presented a paper on "Early Evolution of the Mammalia" before the Society for the Study of Evolution, at Madison . . . . **Rupert L. Wenzel,** Curator of Insects, was interviewed on Radio Station WENR on September 11, on the migration of monarch butterflies.

George Woodward

Free Movie Time . . .

PROGRAMS FOR CHILDREN SATURDAY MORNINGS

The Raymond Foundation will present nine free programs of motion pictures for children at 10:30 A.M. on Saturday mornings throughout October and November in the James Simpson Theatre of the Museum. On two of the programs, October 10 and October 17, the men whose experiences are shown in the films will tell the children their stories of adventure.

Following are the dates of the programs and the titles of the pictures:

October 3—ARCTIC BORDERLANDS
Also a cartoon

October 10—HOLIDAY ISLAND OF THE CARIBBEAN (HAITI)
Peter Alt, narrator

October 17—ALPHABET OF THE OUTDOORS
Dick Bird, narrator

October 24—THE AMERICAN COWBOY
Also a cartoon

October 31—FUR TRAPPERS WESTWARD
Also a cartoon

November 7—THE ANTARCTIC—HOME OF THE PENGUINS
Also a cartoon

November 14—ESKIMO HUNTERS
Also a cartoon

November 21—THE PRAIRIES
Also a cartoon

November 28—BEAR COUNTRY (one of the Disney "True-Life Adventure" series)
Also a cartoon

Children may come alone, accompanied by parents or other adults, or in groups from schools, clubs, and other centers.

MUSEUM MEMBERS' NIGHT
Monday, October 5

ZOOLOGICAL COLLECTION FROM 'LOST WORLD'

Specimens for addition to the collections of the Museum's Department of Zoology as well as of its Department of Botany were obtained by the recently concluded botanical expedition to the "lost world" of Venezuela led by Dr. Julian A. Steyermark, Curator of the Phanerogamic Herbarium. (An account of the botanical results appeared in the September BULLETIN.)

Charles Griffin, who accompanied the expedition during the first month and a half as zoologist and assistant, collected 51 fishes representing 17 species, 20 bats representing five species, 21 birds, a snake, two mice, and some scorpions and insects. After Griffin left the expedition in late April, Curator Steyermark continued to collect zoological specimens in odd moments he could snatch from his regular collecting. This resulted in the addition to the zoological collection of numerous spiders, insects, snails from the summit of Chimantá-tepuí, a few frogs, and a couple of swifts. Preliminary work on the bats and fishes has already shown that undescribed species and rarities of genera and species new to Venezuela or to the Museum's collection are included.

SPECIAL EXHIBIT—

(Continued from page 5)

Botanic Lottery proved to be a complete financial failure and, upon his death, Thornton left his family almost penniless.

The set of 32 plates from Thornton's *Temple of Flora* exhibited on the main floor of the Museum is the property of Walter S. Ross, of Chicago, who kindly consented to lend it for this purpose. As each plate is exquisitely framed, the entire collection can be displayed at the same time.

A copy of the book, originally part of the famous Lord Beckford Collection of Hamilton Palace, is being shown through the courtesy of Mrs. Roy Arthur Hunt, of Pittsburgh.

Apart from the extraordinary beauty of the plates of Thornton's *Temple of Flora*, the work is an important historical document, because the best available methods of illustration and reproduction of its time were used in producing it.

PLEASE NOTIFY MUSEUM IF YOU'RE MOVING

Members of the Museum who change residence are urged to notify the Museum so that the BULLETIN and other communications may reach them promptly.

A card for this purpose is enclosed with this issue.

Members going away for extended periods may have Museum matter sent to their temporary addresses.

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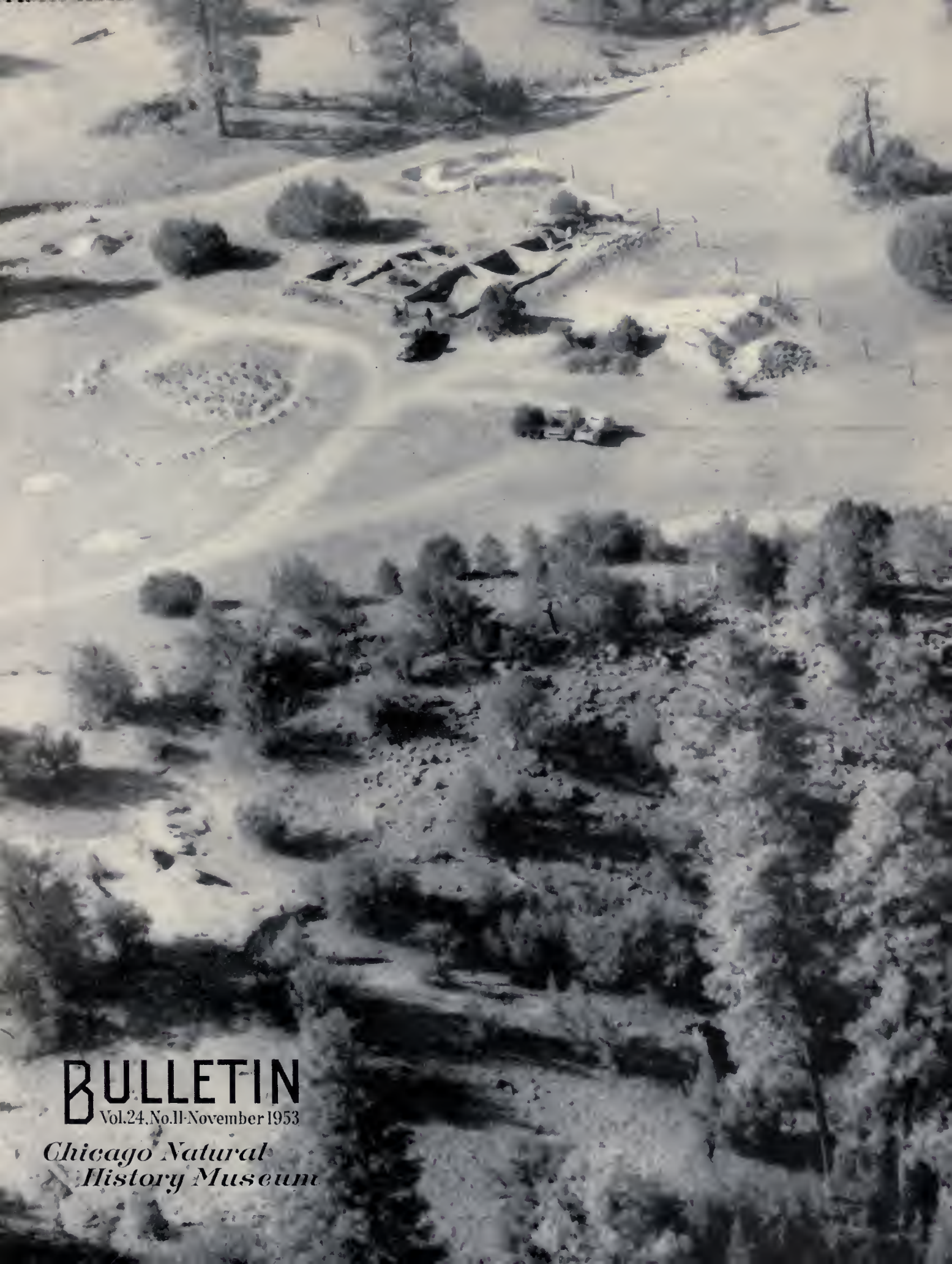

BULLETIN

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Chicago Natural History Museum

Chicago Natural History Museum

FOUNDED BY MARSHALL FIELD, 1893

Roosevelt Road and Lake Shore Drive, Chicago 5

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THE FIRST MUSEUMS OF NATURAL HISTORY

MUSEUMS, I believe, had their origins in somewhat diverse human interests —one in the collection of curiosities, another in the accumulation of mementoes and of "trophies of the chase," and certainly still another in the search for medicinal plants and other substances to be used in medicine. In the fourth century B.C., Aristotle had already accumulated the nucleus of a museum collection. He certainly displayed the catholic curiosity about the world around him that characterizes the museum naturalist. The prototype of the "museum expedition" may perhaps be discerned in the by-product of "specimens" from the invasions of Alexander the Great, who sent back strange animals and other objects to his greater teacher for study and description.

The periods of the Roman Empire and of the Dark Ages intervened between Aristotle's pioneer investigations of nature and the renewal of interest in natural history that came with the multilateral expansion of the human spirit in the Renaissance—say beginning with the invention of printing in Europe about the year 1440. The barrenness of Roman times in the development of natural history is well illustrated by the wholly uncritical *Natural History* of Pliny, in which mythology is inextricably interwoven with fact, with no thought of examining actual animals or plants. The mediaeval contribution to natural history was an even less significant melange of curious facts and misinformation. Aristotle's beginnings of observational description became fixed dogma, so that when Aristotle had given an erroneous figure for the number of teeth in the horse, his statement was regarded as quite refuting any mere attempt to recount them from an actual skull.

By the end of the 16th century considerable strides had been made in the accumulation of museum specimens, mainly dried animals and parts of animals, dried plants, and rocks and minerals. Four volumes of Aldrovandi's *Natural History* had appeared by the time of his death in 1605, and the work was continued by his students at the University of Bologna. It is noteworthy that Aldrovandi's published work was based on accumulated collections; much of this material is still to be seen at Bologna, and the Aldrovandian Museum may well be thought of as the first museum of natural history worthy of the name.

During the centuries of the Renaissance, along with the development of secular art collections and the renewed establishment of libraries, the custom had developed of maintaining cabinets of curios or cabinets of natural history that became fashionable at every court in Europe, a fashion imitated by wealthy merchants in succeeding centuries. This mode of origin of modern museums has left its stamp in the prefix of "royal" in the names of so many European museums.

The "cabinets of curios," by their emphasis on mere miscellanies of curious objects, of freaks and oddities, which could astonish and amuse or even horrify, but could scarcely instruct, exercised a most pernicious retarding influence on the developments of education and research. The origin of the great national and municipal museums, and of the systematic description of nature based on more permanent collections, comes in the succeeding centuries.

Turning back to another of the principal roots of the museum of natural history, we must recall the use of skins for clothing and bedding, of horns as drinking vessels, and of bones and antlers as tools by our more remote European ancestors. The love of hunting still so strong in modern man is not difficult to understand, the more so with the prestige lent to the chase by royalty throughout the rise of civilization in Europe. One of the first notable historical uses of hunting trophies, almost, at least, with the modern idea of instruction, may be seen in the mounted skins of the two types of European wild oxen, the aurochs and bison, set up in his hall by the Freiherr von Heberstein about the year 1550. Von Heberstein had been enormously impressed by the imposing size of these great animals, whose skins and skulls he had brought from the forests of Poland to Vienna. These animals had formerly ranged over most of Europe. By the time of Julius Caesar they had become extinct in France—he reports the aurochs as the "urus" of the Teutonic forests, "but little smaller than elephants."

During the Middle Ages the range of both bison and aurochs had been steadily restricted so that they were no longer widely known, and even the radical differences between them came to be forgotten. Thus the Heberstein exhibit parallels attempts of modern museums to preserve for public instruction the specimens of the animals that have become rare or extinct in historic times. The vast collections of heads and horns to be seen in many museums, often inherited by them from the "trophy rooms" of private individuals, attest to the long continuance of the hunting trophy as a source of museum material. Even the most progressive of museums bear evident traces of the patronage of the "big game hunter." The integration of such specimens into the modern museum is a late development.

The story of the search for medicinal plants and its effect on the development of the science of botany is a fascinating chapter in the history of science in general and of the botanical museum.

KARL P. SCHMIDT
Chief Curator of Zoology

THIS MONTH'S COVER

A 20th-century airplane-view of a 13th-century village of prehistoric American Indians is shown on our cover. It is a site in New Mexico excavated during the past summer by the Museum's Southwest Archaeological Expedition under the direction of Dr. Paul S. Martin, Chief Curator of Anthropology. Seven of the fourteen rooms that were opened up may be seen. From them the expedition recovered a wealth of artifacts which, when fitted in place with the findings of eighteen past seasons of Southwest digging, are filling in gaps in the jigsaw puzzle of reconstructing the history and cultural attainments of an extinct tribe designated by the name Mogollon. The photograph was made at an altitude of about 1,000 feet above ground by James Barter during a flight in the private airplane of Dr. Lester H. Keys.

Japanese Prince Visits Museum

Prince Akihito of Japan was a Museum visitor during his stopover in Chicago on his recent tour of the United States.

13th-CENTURY LIFE IN NEW MEXICO WAS ALMOST 'MODERN'

By PAUL S. MARTIN
CHIEF CURATOR, DEPARTMENT OF ANTHROPOLOGY

By the time the Crusades were well under way in the Old World and in a period when the peasants in northern Europe were living under a feudal system, the Mogollon Indians, who lived in what is now western New Mexico from about 2500 B.C. to A.D. 1300, were enjoying a life far richer, freer, and more comfortable than were the peasants of Europe. In fact, the Mogollon Indians were better off in the 13th century than many peoples of the world are in our own day and age. This was confirmed by the findings of the scientists of the 1953 Southwest Archaeological Expedition of Chicago Natural History Museum through their intensive digging this past summer in the remains of an ancient Mogollon village near Reserve, Catron County, New Mexico.

This ancient village, perched atop a high ridge overlooking the San Francisco River, is slowly being exposed to the 20th-century sunlight after having been buried 800 years. In the 1953 season of excavations expedition workers dug through fallen walls and masses of rubble to gain access to the ground floor rooms of this two-story apartment house. Part of this rubble is composed of the walls, floors, and nonperishable furnishings of the second-story rooms. When the archaeologists approached the ground floor level, the greatest care was exercised in digging, because it was foreseen that here would be the treasured belongings of the people who built and lived in this apartment-house town or "pueblo" about A.D. 1200–1300. Fourteen rooms were uncovered and from them much information was obtained—the information that enables us to answer questions about the life and customs of these now extinct people.

During the course of excavating one of the secular rooms, we encountered a group of stone objects on the floor near a firepit where they had lain for perhaps 800 years.

AIR CONDITIONING IN A.D. 1300

Looking down into dwelling room of Mogollon house, fresh-air duct is seen to left of striped arrow. Connecting air outlet appears in wall at bottom, left foreground. There is a firepit with ashes to right of arrow and a slab-lined bin to the right of meter-stick in center of scene. The fresh-air duct was formerly roofed over with poles and covered with earth so that it was flush with the floor.

As the debris was slowly removed from around these objects we could hardly believe our good luck when we realized what we had discovered. The cache of stone objects consisted of five pieces all well carved from a native stone: two animal effigies, a dish, a tubular tobacco pipe (7 inches long), and a disk about 8 inches in diameter. All of these objects were gayly painted in stripes in four colors—black, red, green, and yellow. The painting on the disk is in especially good condition and the design may represent the sun's rays. This is indeed a rare find.

The use of these objects is problematical. But, from our knowledge of modern nearby Indians (Zuni and Hopi), we guess that they were used in ceremonies having to do with hunting, good crops, rain, or general good luck in any venture. The animals may represent a bear or wildcat and may have been thought to be suffused with a spirit or magic influence over the hearts of the animals they prey upon. This magic power of the animal fetish helped the hunter overcome his prey. Just how the pipe, dish, and sun-symbol disk were used is not known.

It is remarkable that these objects should have been left behind by their owners and that they were not stolen by other Indians who may have wandered through the area after the pueblo was abandoned. We can only guess that the power or magic of these things was believed to be so great that later marauders, wanderers, thieves, and looters (Indians) were afraid to take them.

BURIALS UNDER THE FLOORS

Under the floors of several rooms we recovered fourteen skeletons, carefully buried, and in many instances provided with tools, weapons, ornaments, and dishes for use in the life hereafter.

The ages of these individuals at the time of death ranged from 12 months to 30 years. Most of the burials are of individuals who were less than 5 years old at death. It seems probable that careful interment and mortuary offerings of clothing, jewelry, food, pottery, and the like were provided because a spiritual life and advanced religious ideas had been developed. Furthermore, in all our digging experience, we have rarely encountered infant burials so liberally endowed with material objects for use in the spirit world. Thus we assume that the love of the mother for her departed ones was a deeply felt emotion. And we also assume a religious and an unselfish attitude had grown up during the ages, and that these people were thus far removed from barbarism and savagery.

STANDARD OF LIVING HIGH

But what further evidence do we have to help support the idea that the Mogollones were not barbarians?

We have evidence from four fields of human endeavor: arts and crafts, architecture, agriculture, and religion.

The crafts of basketry, textiles, the manufacture of stone and bone tools, and pottery-making were all highly advanced by the Tularosa period (about A.D. 1250). What the Indians lacked in materials (principally metals) they compensated for by great skill and ingenuity in using what was at hand. The pottery reached a new high not only in beauty and skill in painted decorations, in firing, and in variety of shapes, but also in ornamentation and treatment of unpainted wares—indenting, incising, forming of patterns by waving and indenting, and smudging. Certainly, the everyday household tools and dishes were superior to those of the 13th-century European.

AIR-CONDITIONED HOUSES

And when we come to architecture, there is no comparison between the Mogollon

house and that of the European serf of the Middle Ages. The Mogollon house was a well-designed and well-built structure with excellent walls of stone masonry. The rooms were comfortably large (14 by 20 feet was not an uncommon size) and many of those in the inner block were actually provided with *air-conditioning*. That is, a special, masonry-lined duct, 10 by 12 inches, brought fresh air from an outside intake under the floors of adjacent rooms and into the inner apartment at floor level. The flow of air was by gravity induced by the building of fire in the inner room. The hot air rose and escaped through a ceiling opening, while cool fresh air flowed into the room. The volume of flow could be controlled by a stone or wooden slab that served as a valve.

In addition to rooms that were commodious, warm, and windproof in the winter and cool in the summer, the building was compact and designed to make it easy for the family and all the relatives on the mother's side to live together and to share work, planting, harvesting, and ceremonies.

One extra large room appears to have been set aside for religious purposes, and here perhaps family or clan rites were performed. Nearby are several large structures that are as yet unpenetrated. Some of these we call plazas, and it is possible that religious dances were performed therein. Others that we call kivas are believed to have been the scene of ceremonies of greater importance.

All in all, these pueblos must have been a pleasing sight with their well-laid, plumb walls made of chosen and shaped stones, their large plazas open to the skies, and their dignified terraced lines composed of rooms of one and two stories.

FARMERS AND HYBRID CORN

The Mogollon Indian bill of fare of the 13th century was varied and nutritious. The staple crops were corn, beans, and squashes, and these were supplemented by several wild foods such as yucca pods, walnuts, pinyon nuts, sunflower seeds, pigweed, amaranthus, wild grapes, tansy mustard, and prickly pear cactus fruit.

Not content with the corn of his grandfathers, the Mogollon Indian constantly selected and bred strains better suited to this environment. Varieties were sought that were resistant to drought and would hybridize with the older local varieties. We also know from our previous research in the area that these Indian farmers were responsible, in part at least, for a continuous improvement in the size of the ear and of the kernels and in a reduction of the number of kernel-rows. For example, at about the beginning of the Christian Era, the cobs were short (about 2 inches long) and the number of kernel-rows was predominantly 10, 12, and 14. By A.D. 1300, the ears of corn were longer and fatter and the predominant number of kernel-rows was 8. This, in brief, makes for more food per ear. It was a more efficient yield.

But man cannot live by corn alone—and he did not have to. There was game aplenty roaming the forests and around the streams. From the ancient garbage dumps and from the litter in the rooms which, it must be admitted, indicate that these fellows were not very good housekeepers, we know that they snared, trapped or shot and presumably ate antelope, deer, rabbit, mountain sheep, turkey, squirrels, and prairie dogs. But no fish—or at least fish were not eaten at home, for we find no fish bones in the dumps.

DEVELOPMENT OF CONSCIENCE

Life, then, in the 13th century in this mountainous, pine-forested western country was free, comfortable, and stimulating. Food was varied and abundant; physical comfort was provided for by well-built clan houses; and man's developing conscience, his love for near of kin, and the Promethean touch in his makeup removed him by many leagues from his less civilized ancestors of previous millenia.

Our study over the years leads us to think that the Mogollones, like ourselves and other peoples, had apparently inborn traits of being dissatisfied, of wanting to strive upward, to change, and to improve their lot through trial and error. These traits may have led to the development of conscience, of morality, of unselfishness, and of religion. They may also have made it possible for the 13th century Mogollon Indian to regard his neighbor's portion without covetousness and therefore to be free of warlike tendencies (we believe that these Indians were peace-loving). It is also possible that these same powerful traits led the Mogollone to recognize a power superior to his and perhaps beyond his comprehension—a power that controlled his universe—and from this recognition and need for superior guidance, he developed a religion that well served his purpose and satisfied his inner cravings for security, peace and comfort in moments of despair, disaster, and death.

The site on which we worked this season spans the property of two ranches owned by Owen McCarty and Ray Hudson. Assisting me in direction of the work, John B. Rinaldo, Assistant Curator of Archaeology, performed valiantly. Others participating in the expedition's difficult tasks were Juan J. Armijo, Juan M. Armijo, James T. Barter, E. D. Hester, Abe Jiron, Arthur Jiron, Julian B. Jiron, Alan Lapiner, David Mabon, Bill Menges, Mrs. Martha Perry, Joseph Shaw, Micky Snyder, and Wayne Spurgeon. Lester H. Keys, M.D., made his airplane available and with the assistance of Mr. Barter took photographs from aloft.

ANCIENT APARTMENT HOUSE

View from tower of dwelling rooms in various stages of excavation under relentless picks and shovels of Southwest Archaeological Expedition's diggers. There remain unexcavated rooms in background and a plaza in foreground whose secrets are still to be bared by the probing tools of the Museum archaeologists.

Caribbean Flower-Tree Paintings to Be Shown in December

A special exhibit of twenty-nine paintings by Bernard and Harriet Pertchick, showing flowering trees of Caribbean countries and islands, is scheduled at the Museum in December. The paintings, which have been highly praised both in botanical and art circles, are the originals for illustrations used in the book *Flowering Trees of the Caribbean*, published under the sponsorship of the Alcoa Steamship Company.

STRIP MINES YIELD FOSSIL TREASURES

By GEORGE LANGFORD
CURATOR OF FOSSIL PLANTS

WHEN I CALLED on the Director of the British Museum (Natural History) in 1896, I identified myself as coming from Joliet, Illinois. "That's not far from Chicago," I added. He looked rather doubtful and reached for an atlas on his desk. As he was turning the pages, I mentioned that I had frequently collected fossils from Mazon Creek and was interested in the British Museum's display of fossil plants from that locality, also not far from Joliet. That cleared things up. Dr. Lankester put away the atlas, remarking, "Oh, I know where Mazon Creek is."

The fame of Mazon Creek lies not in its scenic beauty but in the small rounded or elongated bodies called concretions that occur in the shale exposed in its banks. They were formed after deposition of the enclosing shale and were the product of accumulation of mineral matter about a center or nucleus, which may be a fossil shell, leaf, or bone. The true concretion is characterized by a concentric structure. Being much harder than the shale that encloses them, these concretions are not damaged by the stream erosion that cuts into the banks. They remain in the creek bed or at the foot of the low bluff. In each one is a beautifully preserved fossil, readily exposed by cracking the concretion with a hammer. For many years the banks and bed of Mazon Creek itself were the only source of these fossil-bearing concretions, but so plentiful were they and so well preserved were their enclosed fossils that they achieved a world-wide distribution in collections of both museums and private collectors. Most geology textbooks contain illustrations of these beautifully preserved fossils.

The concretion-bearing bed lies directly above an important bed of coal, known by various names, such as "Wilmington Coal," "Colchester Coal," and "Number Two Coal." In 1927, work was begun near Wilmington to strip off the twenty-five feet or so of shale in order to scoop up the coal and sell it. The venture was a success, and by the time the stripping stopped in 1950, many square miles of shale had been piled up in Will and Grundy counties, reaching nearly to Mazon Creek on the west.

The fossil-bearing part of the locality, where concretions are freed by weathering from the heaped-up shale, is for the most part in Will County, with only a small portion of the spoil heaps in Grundy County to the west yielding good fossils. Beyond an unmined stretch of about seven miles lies Mazon Creek. Beneath the ground, where it has not already been scooped up, is the Wilmington Coal, the most ancient of the coal beds suitable for economical mining in this district. Its age is computed at about 250 million years.

When I began collecting in 1937, the Wilmington area was already given over to strip mining. Giant electric cranes were picking up the overburden of glacial sand and concretion-bearing shale and piling it aside. The pebble-like concretions lay conspicuously on the surface where the shale had weathered to clay. When I split them open I found that many of them contained fossils like those of the Mazon Creek beds. These fossils were mostly ferns and other plants, but occasionally I found small invertebrate animals—insects, clams, crustaceans, and other forms.

In these reminiscences of sixteen years of intensive collecting, Curator George Langford covers a period in which he turned from his profession of engineering to spend full time on his lifelong hobby, fossils. A member of the class of 1897 at Yale's Sheffield Scientific School, he was stroke of the crew that raced Oxford and Cambridge on the Thames in 1896. On graduation he went to work for the McKenna Process Company in Joliet, where he improved methods of treating defective railroad rails and took out more than one hundred patents in railroad metallurgy. He made important archaeological excavations in Illinois, supervised the building of four steel-treating mills, collected several Ice Age mastodons, and started his fossil-plant collection. Since retiring from the McKenna Company, of which he had become president, he has devoted most of his time to the Wilmington fossils.

SHARAT K. ROY
Chief Curator of Geology

CURATOR GEORGE LANGFORD
Museum's fossil-plant expert with part of collection.

One half of a concretion containing a fern displays the impression of the top surface and the other the impression of the bottom surface. A thick fruit may be represented by an outer husk impressed on one half and a nut-like seed on the other, giving two views of the specimen. The preservation of the specimens is remarkably fine. Veins of delicate leaves remain as clear as the engraving on a bank note. One may see minute details of the spore cases of ferns, the scale-like bark of strange extinct trees, the hairs of a pubescent leaf. The eyes, bristles, and even the heart of spider-like arachnids have been recognized.

While the mine pits were being actively dug, I collected principally from the spoil heaps, but I managed also to collect many specimens in their original undisturbed positions in the walls of the cuts. No two pits were alike in depth or in the succession of beds exposed in the walls; some were almost barren of fossils or yielded concretions with only poor specimens. The pits to the west and north, actually those nearest to Mazon Creek, yielded practically no fossils.

I hunted over the whole mined area while

(*Continued on page 7, column 1*)

YOU MAY WEAR SALMON AS WELL AS EAT IT

Exhibits in the Museum often display—years in advance—the latest innovations in modern dress style, scooping even the "newest fashion" zealots of Fifth Avenue and Michigan Boulevard. Such a scoop can be found in Hall L where there is a salmon-skin dress on display. Not that American women are going to be donning salmon-skin dresses as their winter outfit, but they may be wearing salmon-skin shoes, belts, and purses. According to a report in the "New Ideas" column of a national magazine, salmon-skin will be the featured leather in many Manhattan stores this fall.

The discovery that fish skin can be used for clothing might cause us mild surprise, but the Ainu of Yezo (now Hokkaido) and Sakhalin Islands, north of Japan, would give this bit of information no more notice than we would give to a report that cotton is being used to make dresses in some far-off place. Authorities on the Far East point out that the Ainu's use of salmon skin to make clothing is not something new. They have long practiced the skill of preparing the skins by removing them from the newly caught salmon, drying them, and then pounding them to softness. To make a dress, the Ainu women fit and sew the skins together, binding and ornamenting the garment with fur or cotton.

Perhaps it would be a good idea for dress and fabric designers to make frequent trips through the halls of the Museum. They might discover that the people of Siberia, Malaya, Africa, etc. have costume ideas which are really "fashion firsts."

FINICKY BIRDS—THEY WASH THEIR FOOD

By AUSTIN L. RAND
CURATOR OF BIRDS

WE NOT ONLY WASH ourselves and our clothes but certain items of our food are regularly washed, such as spinach, to get the sand out of it. Washing has been so important in our society that we have the saying that cleanliness is next to godliness. Possibly we've the snobbish idea that

it's a strictly human trait. We don't expect to find water used for such cleanliness amongst other animals, and the raccoon, who does wash his food, is considered a sort of biological oddity. But when we come to birds we find a surprising number of them that wash their food.

The dipper of our western mountains in Oregon has been seen to wash insects and grubs before feeding them to the young birds. The parents held the food crosswise in their bills and twisted their heads rapidly from side to side in the water. Not until then was the food taken to the nest for the young.

The scene shifts to Africa. Four buff-backed herons were feeding on a flooded lawn at Gezira in Egypt. One of the birds captured a large insect, apparently a large black beetle. Holding the beetle in the tip of its bill, the bird walked to the water, immersed the insect three times, shaking and fumbling with it the while, and then swallowed it.

In Britain there came a whole host of records after an observation in Holland in 1946 of curlew sandpipers. The birds were probing the dry mud at the edge of a little creek. When one of the birds got a small sand worm, it at once ran with quick steps to the creek and stepped into the shallow water where it dipped the worm a few times into the water before swallowing it. Then it trotted away for more. The editors of *British Birds*, the journal in which this was published, suggested that this might be a more common habit than the scanty published records would indicate and invited observations.

In the succeeding numbers of the journal a spate of records resulted: a whimbrel washing crabs, a snipe washing earthworms, godwits washing their food. With curlews food-washing was reported to be normal. Dunlins, greenshanks, redshanks, ringed plovers, and oyster-catchers were all reported washing their food, until it appears that with the group of birds we call shore-birds—sandpipers, snipes, plovers, and their relatives—food-washing may indeed be normal. The details of the observations strongly suggest that the reason for the washing, in many cases at least, is the same as our reason for washing spinach—to get the sand and mud out of it.

F. G. Evenden recorded dippers (*Cinclus mexicanus*) in Oregon washing food for their young (*Condor*, 45: 120, 1943), and the buff-backed heron in Egypt was seen by Derek Goodwin (*British Birds*, 41: 121, 1948). When Francois Haverschmidt published his note on the curlew sandpiper (*Calidris testacea*) in Holland, the editors' request for further information (*British Birds*, 39: 185, 1946) resulted in many other short notes published in the same journal in 1946 and 1947.

FIVE NAMED TO JUDGE NATURE PHOTOS

The names of the five judges who will make the awards in the Ninth Chicago International Exhibition of Nature Photography have been announced by the Chicago Nature Camera Club, co-sponsor of the contest and show. Those appointed are: Roland Eisenbeis, Senior Park Naturalist, Forest Preserve District, Illinois; Robert F. Inger, Assistant Curator of Fishes at the Museum; Rachel M. Osgood, photographer; Jack Remde, photographer; and Rupert L. Wenzel, Curator of Insects at the Museum.

Entries are now being accepted, and should be sent to Chicago Natural History Museum, which will furnish forms and a complete outline of the conditions of the contest on request. Final deadline for entries will be January 14. Winners of the awards will be announced just prior to the opening of the exhibition, which will be held February 1–28 at the Museum.

The exhibition will be composed of two divisions: Prints and Transparencies. There will be three classifications in each division. They are: Animal Life, Plant Life, and General (scenery, geological formations, clouds, and other nature phenomena not included in the other two classifications). Silver medals and ribbons will be awarded in each print and slide classification, and the names of winners will be inscribed on the Myrtle R. Walgreen plaque.

Museum Contributor

The late Thomas J. Dee, of Chicago, was posthumously elected by the Board of Trustees to the roll of the Museum's Contributors. This honor, which continues in perpetuity, was in recognition of generous contributions of funds to the Museum.

CURATOR HAAS COMPLETES WEST COAST STUDIES

Dr. Fritz Haas, Curator of Lower Invertebrates, has returned to the Museum from a field trip to the West Coast. Dr. Haas collected representative specimens of marine, freshwater, and land invertebrate specimens, and engaged in research, comparing the littoral animal life of Vancouver Island, British Columbia, with that of the southern California Pacific coast and also the Atlantic coast. His headquarters were made at the Pacific Biological Station at Nanaimo on the island. He also traveled through Washington, Oregon, and northern California, investigating the lower invertebrate fauna of the redwood forests in state parks and on lumber industry properties. Among the snails, clams, and other creatures he collected are a number believed new to malacological science. He also studied the problem imposed by invasions of the large Japanese oyster which has in certain areas become a menace to native oysters.

Change in Visiting Hours

Museum hours, which have been 9 A.M. to 5 P.M. in the autumn, will change to the winter schedule, 9 A.M. to 4 P.M. during the period from November 1 to February 28.

NEW MEMBERS

The following persons became Museum Members from September 14 to October 15:

Contributor
Thomas J. Dee*

Life Member
James A. Cathcart

Associate Members

Maxwell Abbell, H. E. Anning, Laurance H. Armour, Jr., R. H. Bacon, E. C. Barker, William Friedlander, Alfred E. Gebhardt, M. J. Sporrer, David B. Stern, Jr., Alfred J. Weil

Annual Members

A. B. Anderson, Mrs. William Butterworth, Mrs. H. L. Calvin, Mrs. Russell G. Cleaver, Bernard G. Colby, Sherman R. Cook, H. J. Felsenthal, Mrs. Harry H. Fuller, Richard J. Galvin, James J. Glassner, Dr. Benjamin J. Gregory, Miss Johnnie Harlow, Mrs. Floy Heaney, George A. Heath, Miss Sara Jepsen, Mrs. Edward J. Kelly, Carl R. Lambrecht, Jr., Lloyd W. Lehman, Thomas P. Liston, J. DeNavarre Macomb, John Madden, Allen W. Mathis, A. Peter N. McArthur, Harley V. McNamara, Maurice B. Mitchell, Mrs. Gilbert H. Osgood, Andrew Poggenpohl, Dr. Stephen Polyak, Dr. E. A. Pushkin, Albert Samuels, Charles H. Schelter, Robert G. Sippel, Mrs. Sherman T. Spitzer, Harold H. Stout, Israel Swett, Sam Terker, Mrs. Daniel M. Vail, Frank Vander Ploeg, Orlin I. Wahl, John A. Watson

* Deceased

STRIP-MINE FOSSILS—

(*Continued from page 5*)

most of it was still free of vegetation. Lately a large part of it has become overgrown with weeds, grass, and trees, making further collecting difficult. The best specimens occurred within a rather limited area, within which I concentrated on about forty good spots, later narrowing those down to twenty where I found the best specimens. Many localities were distinguished by the abundance of one or another species or by the absence of species common elsewhere.

COLLECTED NODULES BY THOUSANDS

In the period 1937–40 I spent nearly two years in the field, a third of that time with the assistance of my son, George Langford, Jr. Our collections of that period are now exhibited in a number of museums. When my son's work kept him from the field, I continued to work alone until I came to Chicago Natural History Museum in 1947, and since then I have taken many trips to the mines with others of the Museum staff. In the sixteen years of my collecting, I have brought home more than 150,000 nodules, representing more than ten times that number actually cracked in the field.

In this great number of specimens, there are about 570 species of plants, of which about 100 are new to science, and there are about 100 species of animals, one-third of which are new. The more we collect, the more new forms we discover. Since 1937 I have been continually revising my manuscript that contains descriptions, photographs, and drawings of all these forms of plant and animal life.

The deposits of the Wilmington area were laid down in fresh water, but some few species of marine aspect were probably washed in from estuaries by storms. The concretion-bearing rock itself is a soft, gray, silty shale. When exposed to the weather in the spoil heaps, it disintegrates to clay, the concretions falling free. Because of a certain amount of iron in the concretions, they redden, or rust, on exposure, announcing their presence to a collector even some distance from the hills. The "roof shale," the bed directly above the coal, often showed carbonized impressions of large specimens of the same kinds of plants as we find in the concretions, but this shale, too, has vanished into clay through years of weathering and we can no longer find large fossil-bearing slabs.

Some of the pits, especially those nearer to Mazon Creek, showed that a body of sandstone representing an old channel-filling had replaced the gray shale. Concretions cannot now be found in that part of the mining area. Lying above the shale in the entire area was originally a ten-foot layer of glacial sand and gravel and a foot of marshy surface-soil. Some of the spoil heaps are now covered with this material, concealing the nodules they may bear.

WIDE VARIATIONS OCCUR

The concretions themselves are varied in appearance. In certain hills they are perfectly shaped but contain no specimens worth collecting; in others, many are septarian concretions containing radiating fissures filled with crystalline calcite that cause these bodies to shatter when struck with a hammer. Other localities produce round concretions, but the contained fossils are coated with pyrite or other minerals. Most good specimens, indeed, are covered with a mineral coating of one sort or another, usually a chalky-white deposit of kaolin. I soon found that I could remove this by scraping or brushing without damaging the delicately detailed hard fossil impression. Specimens in other collections have oxidized badly with time, turning a deep red and becoming soft. I found that a thin solution of dextrin, a form of starch, brushed over the specimen with a fine paint brush, would prevent this. Specimens treated in this way fifteen years ago show no sign of deterioration today. Besides protecting the specimen, the coating of dextrin enhances the contrast of color between the specimen and its background.

The Wilmington deposit is only fifty miles from Chicago. Its great numbers of specimens and of species have made it a favorite collecting locality not only for myself and other Museum staff members but for a constantly growing number of amateurs. The continued interest of the Museum is explained by the fact that new species are still being discovered on almost every short collecting trip as well as fine specimens of well-known species. We will continue to collect there until the encroaching undergrowth and trees finally cover the spoil heaps and hide the concretions. But for many years after that, this area, once considered an unsightly blot on the prairie landscape, will continue to be a favorite recreational spot, with clear ponds occupying the former mine pits and green hills teeming with wild life, a rare sight in the flat lands of northeastern Illinois.

Daily Guide-Lectures

Free guide-lecture tours are offered daily except Sundays under the title "Highlights of the Exhibits." These tours are designed to give a general idea of the entire Museum and its scope of activities. They begin at 2 P.M. on Monday through Friday and at 2:30 P.M. on Saturday.

Special tours on subjects within the range of the Museum exhibits are available Mondays through Fridays for parties of ten or more persons. Requests for such service must be made at least one week in advance.

Although there are no tours on Sundays, the Museum is open from 9 A.M. to 4 P.M.

STAFF APPOINTMENTS

Two new appointments to the Museum's scientific staff were announced last month by Colonel Clifford C. Gregg, Director. John W. Thieret was named to the post of Assistant Curator of Economic Botany, and M. Kenneth Starr was appointed Curator of Asiatic Archaeology and Ethnology.

M. Kenneth Starr

Mr. Thieret, who was Chicago Natural History Museum Fellow of the University of Chicago from October, 1951, to October this year, received his Bachelor of Science and Master of Science degrees from Utah State Agricultural College. He has satisfied all requirements for a Doctor of Philosophy degree at the University of Chicago, and this distinction will be conferred upon him in December.

John W. Thieret

Mr. Starr received his M. A. degree in 1947 after doing undergraduate work at Duke University where he majored in Far Eastern history. He then spent two years in northern China as headmaster of an American school. Returning to the United States Mr. Starr began work at Yale University toward a Ph. D. in anthropology, and he is now in the process of completing his dissertation. He has a broad knowledge of Chinese language and literature.

Both new staff members began their duties at the Museum in October.

CURATOR RAND TO COLLECT BIRDS IN PHILIPPINES

Dr. Austin L. Rand, Curator of Birds, will fly from San Francisco to Manila to represent the Museum at the Pacific Science Congress which will be held in the latter city November 16–28.

After participating in the important sessions of the congress, Dr. Rand will collect birds for the Museum collections on an expedition to the island of Negros in which he will be joined by Dr. Dioscoro S. Rabor, a Museum Field Associate who is professor of biology at Silliman University in the Philippines. Dr. Rand will be in the islands for several months.

An entire hall of the Museum (Hall 8) is devoted to the ancient American cultures of the Mayas, Aztecs, Toltecs, and Zapotecs.

On Saturday Afternoons . . .

FOUR MORE LECTURES, FILMS FOR ADULTS

The Autumn Course of free lectures and color motion-pictures for Museum Members, their guests, and other adults will continue through November with programs on each of the four Saturday afternoons of the month. The lectures, which are provided by the Edward E. Ayer Lecture Foundation Fund, are given in the James Simpson Theatre of the Museum at 2:30 P.M. Because of limited accommodations, admission is restricted to adults; for children special free motion-picture programs are given in the Theatre on the mornings of the same Saturdays under the auspices of the Raymond Foundation.

Following are dates, titles, and lecturers for the remainder of this season's series for adults:

November 7—ICELAND, CAPRI OF THE NORTH
Robert Davis

November 14—THE HAWAIIAN ISLANDS
Yew Char

November 21—ATOMS AND ATOLLS
Colonel John Craig

November 28—SEVEN WONDERS OF THE WEST
Francis R. Line

No tickets are necessary for admission to these lectures. A section of the Theatre is allocated to Members of the Museum, each of whom is entitled to two reserved seats. Requests for these seats should be made in advance by telephone (WAbash 2-9410) or in writing, and seats will be held in the Member's name until 2:25 o'clock on the lecture day.

STAFF NOTES

David Dunsmuir has been appointed Captain of the Guard, filling the vacancy caused by the retirement on pension September 30 of George Woodward. Mr. Dunsmuir has been a member of the guard force since 1944 and was promoted to Sergeant in 1949. . . . . **Gustaf Dalstrom**, Artist, Department of Anthropology, is one of four artists whose drawings are being exhibited by the Renaissance Society at the University of Chicago, continuing through November 14 in Goodspeed Hall . . . . **Elaine Bluhm**, Assistant, Archaeology, told about the dig she engaged in this summer on a Channel 5 television program, Sunday, October 18. . . . . **Dr. Karl P. Schmidt**, Chief Curator of Zoology, returned on October 15 from the 14th International Zoological Congress at Copenhagen, from a subsequent vacation in Europe, and from brief field work in Palestine . . . . **Dr. Sharat K. Roy**, Chief Curator of Geology, has returned from Washington, D.C., after three weeks at the U. S. National Museum where he worked on preparation of a new catalogue of meteorites in the Museum collection and where he studied the chondritic structure of stony meteorites. He also collected specimens in Connecticut for exhibit cases on physical geology . . . . **Henry S. Dybas**, Associate Curator of Insects, returned October 22 from a collecting trip in southern Mississippi, Louisiana, and Arkansas.

Former Museum Ald Dies

John Emil Liljeblad, former Assistant Curator of Insects, died October 2 at the age of 91 in Van Nuys, California. Mr. Liljeblad joined the Museum staff in 1915 and retired on pension in 1940.

Fulbright Scholar at Museum

Professor H. Stubel of Erlangen University in Bavaria is at the Museum on a Fulbright Fellowship. He is engaged in research on the aboriginal tribes of China.

GIFTS TO THE MUSEUM

Following is a list of the principal gifts received during the past month:

Department of Anthropology:

From: John Borden, Spring Lake, Mich.—model of Aleut bidarka, Aleutian Islands

Department of Botany:

From: Holly R. Bennett, Chicago—150 grasses, 350 miscellaneous phanerogams, Illinois and Indiana; New York Botanical Garden—419 Rubiaceae, South America; Bryan Patterson, Homewood, Ill.—2 *Pinus ponderosa* var. *scopulorum*, Colorado; Catherine Zeller, Springfield, Ill.—3 pine specimens, Illinois

Department of Geology:

From: Beta Research Laboratory, Chicago—25 natural elements

Department of Zoology:

From: Harry Hoogstraal, Cairo, Egypt, and Col. W. V. King, Orlando, Fla.—59 species of mosquitoes, New Guinea; U. S. Naval Medical Research Unit, Cairo, Egypt —4 lots of fishes, Egypt; Marian R. Weimann, Chesterton, Ind.—2 frogs, 2 lizards, Isle of Rhodes; Dr. Rainer Zangerl, Hazelcrest, Ill.—2 lots of preserved marine fishes, Florida; Joseph Bauman, Chesterton, Ind. —2 salamanders, Illinois; Dorothy Beetle, Laramie, Wyo.— 5 lots of freshwater shells, South America; Bernard Benesh, Burrville, Tenn.—9 insects, United States and Europe; Chicago Zoological Society, Brookfield, Ill. —giant panda; Dr. Harold Dodge, Savannah, Ga.—paratypes of 7 Sarcophagid flies of genus *Ideamonima*, southeastern United States; Charles L. English, Miami, Fla.—4 bats, Florida; Florida State Board of Health, Jacksonville—268 bats, Florida and Georgia.

Free Movie Time . . .

PROGRAMS FOR CHILDREN SATURDAY MORNINGS

Four more free moving-picture programs for children will be given on Saturday mornings during November by the Raymond Foundation. The movies start at 10:30 A.M., and are presented in the James Simpson Theatre of the Museum. Following are the program dates, and titles of the pictures:

November 7—THE ANTARCTIC—HOME OF THE PENGUINS
Also a cartoon

November 14—ESKIMO HUNTERS
Also a cartoon

November 21—THE PRAIRIES
Also a cartoon

November 28—BEAR COUNTRY (one of the Disney "True-Life Adventure" series)
Also a cartoon

Children may come alone, accompanied by parents or other adults, or in groups from schools, clubs, and other centers.

Books

(All books reviewed in the BULLETIN *are available in The Book Shop of the Museum. Mail orders accompanied by remittance including postage are promptly filled.)*

WAYS OF MAMMALS. By Clifford B. Moore. The Ronald Press, New York, 1953, 273 pages. Price $3.50.

The *Ways of Mammals, In Fact and Fancy* explains and eliminates many of the old, popular, and supersititous beliefs about mammals. As many of these ideas are still persistent today, for fiction always seems to have more appeal than fact, the book is a valuable reference to their origin and explanation.

The hoofed mammals, bats, marsupials, carnivores, rodents, whales, and primates are all discussed, as are "Beliefs About Mammals."

The work is largely anthological, with at least thirty recent American mammalogists represented. Articles or excerpts have been used from the *Journal of Mammalogy, Natural History, Field and Stream, Saturday Evening Post*, and books on mammals. There is a complete list of literature cited, a bibliography, and an index. The work should prove very useful to the layman and especially to those who are called upon to answer popular questions concerning mammals.

COLIN C. SANBORN
Curator of Mammals

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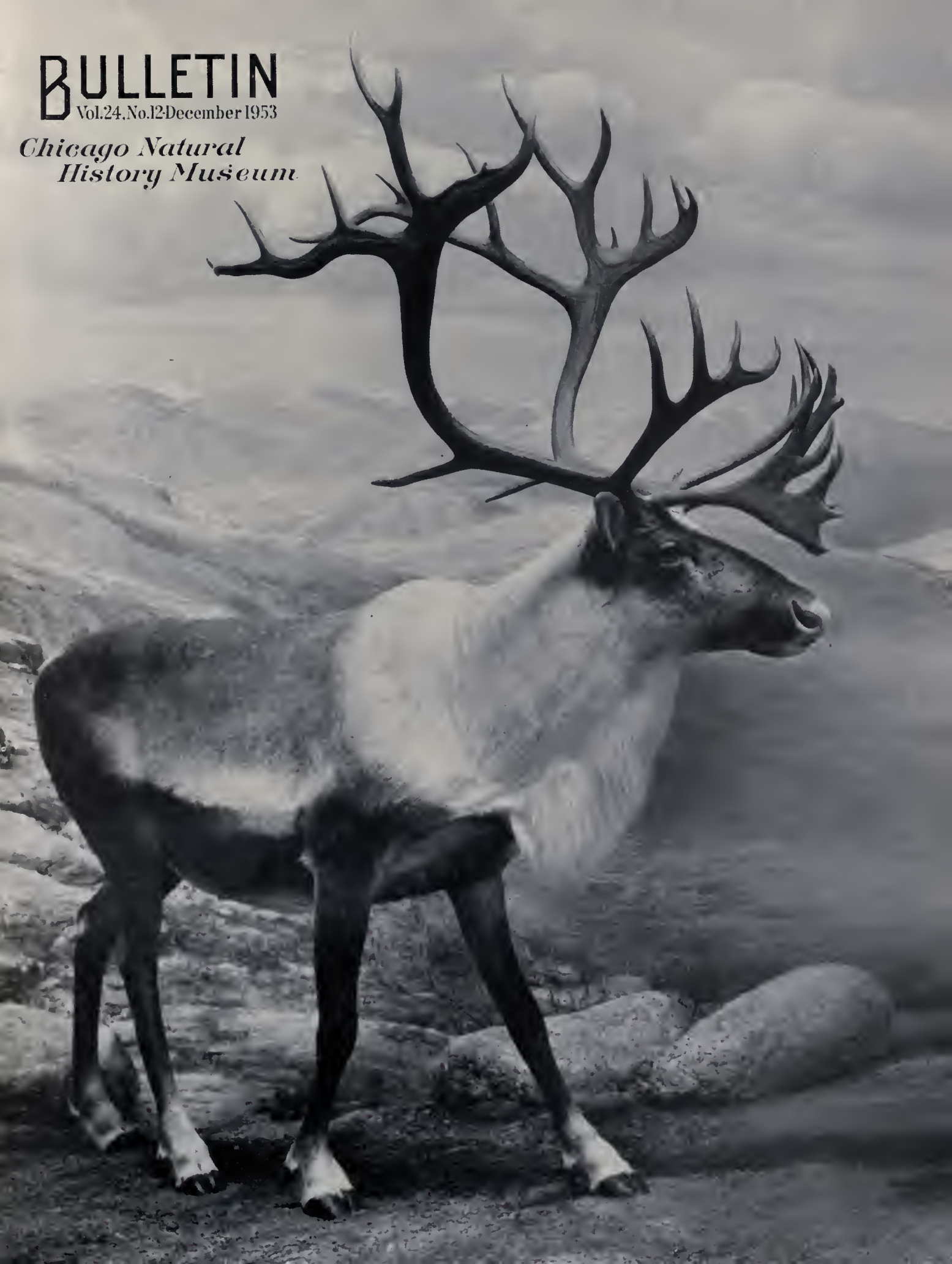

Chicago Natural History Museum

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CHRISTMAS

BY M. KENNETH STARR

CURATOR OF ASIATIC ARCHAEOLOGY AND ETHNOLOGY

SO COMPLETELY are most of us immersed in the waters of our own cultural tradition that we sometimes forget that much of the world does not observe Christmas, for Christmas is essentially a European tradition. "Everywhere, everywhere, Christmas tonight" is the sentiment born of a limited world view. Humility suggests that we recognize the fact that many peoples in Africa, the Americas, and Asia do not celebrate our festivals but follow different rounds of annual observances, defined by their own traditions and environments.

A WIDER TRADITION

We may gain a deeper appreciation of our own customs and a broader base for intercultural understanding if we reflect upon Christmas in its wider context. The Christian church drew itself together slowly at first, and the date of Christ's birth was not finally fixed until A.D. 440 when church decree established December 25 as the date, a choice that was arbitrary, for the actual date of His birth is unrecorded.

The selection of December 25, however, seems to have been made with purpose well in mind, for it coincided with the date accepted at that time as the day on which the winter solstice occurred. The church thus seems intentionally to have fastened onto a date long associated with pre-Christian rites generally related to sun worship and, particularly, to the winter solstice. Traditional loyalties were thus more easily enticed, and subsequent annual ceremonies gradually lost their original pre-Christian meaning.

Thus, Christmas of recent centuries has diverged from winter solstice rites that were widespread at an earlier time and has incorporated customs from various sources. Only traces of the older patterns linger on as isolated survivals, the mistletoe and the Yule log being examples. This original association of Christmas with the winter solstice serves to join us more closely to many non-Christian peoples, for Europeans were not alone in their observance of the winter solstice. Numerous peoples, scattered across the northern hemisphere in Europe, Asia, and the Americas, noted the steady movement of the sun southward as summer passed into fall and fall into winter, and these peoples marked the solstice with ceremonies of various kinds.

VARIATION ON A THEME

Smaller cultures around the world still observe the solstices ceremonially, as for example, some of the American Indians. Eastern Asia, however, provides an example of a larger culture that until recent times observed the solstices, for in China, Japan, and Korea the change of the seasons was accompanied by religious and secular ceremonies.

In China, where the rites were most elaborate, the observance of the winter solstice was but one of the ceremonies associated with astronomical phenomena, for the Chinese calendar, born of the needs of an agricultural people, accorded high emphasis to the changes of the seasons. Of the various calendrical ceremonies, the one occurring at the time of winter solstice was in Imperial times, prior to 1911, the most important. It was the occasion upon which the emperor, akin to the French kings with respect to his divinity, paid obeisance to Heaven, carrying out severely formal ritual at the Altar of Heaven in Peking. Popular celebration also marked the occasion, though not in a manner comparable with the New Year festivities that followed a few weeks later.

In 1911, with the advent of the Chinese Republic, formal recognition of the solstices was abandoned, as were most of the other state ceremonies, and the winter solstice was relegated to the status of a mere calendrical notation. The present government in China continues likewise to break the bonds of earlier tradition, while endeavoring, as is to be expected, to create new bonds of tradition based on persons and events significant for Communism.

With the disappearance in Eastern Asia of this remnant of an ancient custom, we are left with our Christmas observances to recall an earlier time when many peoples were joined by their common solemnization of the winter solstice. There were variations from place to place across the hemisphere, but the theme was constant. Now we are among the last major bearers of the vestiges of an ancient tradition, and in observing Christmas—which itself was changed appreciably in our century—we may gain in sophistication and satisfaction if we remember the larger context into which it fits.

Suggested Reading: For those who find pleasure in musing upon the origins of our Christmas customs, two references may be given. The first, a general one, is the *Encyclopaedia Britannica*. The second, more specialized, though not limited to Christmas alone, is Sir James G. Frazer's *The Golden Bough*, which has lived through many editions. The general reader will prefer the one-volume edition (New York, The Macmillan Co., 1941). For more hardy readers who wish to prepare for Christmas 1954, there is also the original twelve-volume edition. Both the single- and multiple-volume editions are well known, skilfully written, and thoroughly fascinating in content.

For brief descriptions of Peking and the Chinese ceremonial calendar, two books may be listed: C. L. Arlington and William Lewisohn, *In Search of Old Peking* (Peking, 1935) and J. Bredon and I. Metrophanow, *The Moon Year* (Shanghai, 1927).

THIS MONTH'S COVER

The large buck caribou shown on our cover is the dominating figure in a habitat group on exhibition in Hall 16. Caribou are the wild reindeer of North America. These superbly formed animals are the dashing, graceful reindeer that draw the mythical sleigh of Santa Claus through the air of Christmas Eve. Just what manner of creatures are they? Their real story is told on page 3 by Philip Hershkovitz, Assistant Curator of Mammals.

Daily Guide-Lectures

Free guide-lecture tours are offered daily except Sundays under the title "Highlights of the Exhibits." These tours are designed to give a general idea of the entire Museum and its scope of activities. They begin at 2 P.M. on Monday through Friday and at 2:30 P.M. on Saturday.

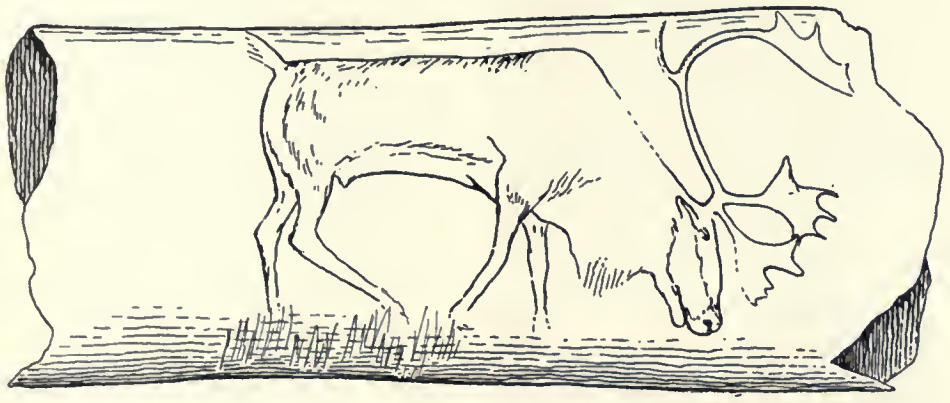
Special tours on subjects within the range of the Museum exhibits are available Mondays through Fridays for parties of ten or more persons. Requests for such service must be made at least one week in advance.

Although there are no tours on Sundays, the Museum is open from 9 A.M. to 4 P.M. The Museum will be closed Christmas and New Year's Day.

THE REINDEER—IMPORTANT TO MAN IN FACT AND FANCY

By PHILIP HERSHKOVITZ
ASSISTANT CURATOR OF MAMMALS

TO MOST of us the reindeer is a fabulous animal and, like Santa Claus, is part of the yuletime legend. Nevertheless, since time immemorial, the reindeer has played a vital role in man's struggle for existence. In the older Stone Age, before metal implements and pottery were invented, the cave man left testimony of his dependence on the reindeer by depicting the animal on stone, slate, and ivory. Indeed, the significance of the animal during the dawn of human culture was so great that the whole period is called the "Reindeer Age." Today, no less than yesterday, the reindeer is indispensable to man on the frozen deserts of Europe, Asia, and North America, where life is coldest and crudest.



REINDEER PLAYS DUAL ROLE IN ART

The animal provides both the subject and the medium for this portrait of itself made 18,000 years ago by a Stone-Age artist on a reindeer bone. The drawing is a reproduction of a paleolith found in Kesserloch Cave, Switzerland. (Illustration by Margaret Bradbury, Artist in Department of Zoology.)

The native wild reindeer of Canada, Alaska, and Greenland is the caribou. It conserves in full vigor the hereditary features and habits that have degenerated or become suppressed in its domesticated brother. Many kinds of caribou have been described, but it is now agreed that these are local varieties of a single species that occurs throughout most of the tundras, forests, and swamps of the Arctic and North Temperate zones of both the Old and New Worlds. The technical name *Rangifer tarandus* for the typical European reindeer is applied, also, to the American caribou. Reindeer, or caribou, are the only representatives of the deer family in the Arctic. The word "caribou" is of Algonquin Indian origin.

ANTLERS ADORN BOTH SEXES

The most distinctive character of the caribou, or reindeer, is the presence in both sexes of immense and peculiarly shaped antlers, a characteristic not found in any other kind of deer. Antlers appear in the young caribou, both male and female, within four or five weeks after birth. In other deer there is no manifestation of antlers until the individual, and then only the male, is at least three months old. In the adult caribou the brow tines of the palmate antlers are plate-shaped and extend forward over the nose. Usually only one brow tine is so developed while the other remains stunted. This tine is not used for shoveling or scraping snow away from forage, as is sometimes stated.

The general body color of the caribou is brown; the neck, beard, and underside of tail and surrounding area on the rump, as well as a band around each foot, are white. There may be a spot or stripe of white on the sides behind the shoulders. Complete or partial albinos occur, especially among the most northern races. In late winter and early spring the pelage is grayish white, a result of bleaching and wearing, and provides camouflage against the snow. The pelage is at its best in autumn and early winter and consists of a coat of oily wool next to the skin and a thick outer covering of coarse hairs and very fine quills. Each of the quills is a true hair specially modified for the winter and filled with air cells. The quills act both as insulators in conserving body heat and as floats when the animal is in water. Caribou or reindeer hairs have been used for making lifebelts, and around 1900 a German invented a reindeer-hair cloth that, when made into suits, was intended to prevent human beings from sinking.

JUST RIGHT FOR SANTA'S SLEIGH

The caribou foot is wonderfully adapted to supporting the animal in traveling over swamps, snow, and ice. The hoof is wide and round in outline, concave on the underside, and capable of considerable lateral spread. When more supporting surface is required the well-developed dew claws, the pastern, and the fetlock of long stiff bristles are also brought to bear and, acting together, like snowshoes, this combination enables the animal to proceed with ease over crusted snow, frozen lakes, and steep icy slopes. The tread of the caribou is characterized by a peculiar clicking or creaking sound produced by the interplay of bones in the ankle. It may be a signal for keeping the herd together. The caribou can combine endurance with speed so that in a race over any great distance it outruns a wolf or any other kind of deer. It has been clocked crossing a lake at the rate of 45 to 50 miles per hour. If sufficiently frightened, a herd can run as much as 100 miles before regaining enough composure to halt or settle down to a walk. The caribou is also an excellent swimmer and, because of its special coat, floats high in the water. One herd of twenty caribou was observed swimming a distance of 1,000 yards in 8 minutes, 25 seconds, or at a speed of better than 4 miles per hour.

FEEDING HABITS

During the spring and summer a fully mature buck feeds, fattens, and grows antlers for the exhausting activity of the autumn rutting season. The fat that accumulates on his back may be two or three inches thick and, as a result, the animal takes on an ungainly appearance. The does and young bucks also fatten but not nearly so much. Once the breeding season begins, old males indulge in fighting with each other and in rounding up the females. So far as known, bucks do not select and maintain the same partners, or harems, but serve the does indiscriminiately. During the rut, bucks eat little or nothing at all, and by the time the season is over their reserve fat is gone, their energy is spent, and they begin the winter in poor flesh.

The year-round food of caribou consists principally of grasses, true mosses and certain lichens called "reindeer moss." Winter is the lean season and the little found to eat consists of twigs of shrubs, lichens, and small clumps of grass and other vegetation that can be smelled out from beneath the snow. When plant growth resumes, caribou change to feeding on green stems, leaves and buds, favoring those of the willow and birch. Antlers that are shed at this time are also eaten for their needed mineral content. The menu of the caribou improves with the advancing season as the quantity and variety of green things and fruits increase. Mushrooms are a favorite food.

SPRING BABIES

The young are born in late spring and, unlike fawns of most other kinds of deer, they are not marked by a pattern of spots. The period of gestation is from 31 to 32 weeks and should twins be born—an unusual event—the mother may destroy one of the two offspring. A few hours after

birth the extremely precocious offspring is afoot and following its mother. Two days later it is strong enough to keep up with the herd, and when it is about a month old the fawn begins to forage for itself. It continues to suckle regularly, however, for many months more, until the next spring, according to one observer.

GREAT MIGRATIONS

The caribou is highly gregarious and normally is found in herds numbering dozens, hundreds, or even thousands. The largest herds, with hundreds of thousands of caribou, are formed by concentrations of smaller groups that travel together during seasonal migrations. The fall migration is performed by massed herds over well-defined ancestral routes. The spring migration, in the reverse direction, is more gradual and scattered, taking place over individual trails that tend to obscure the mass movement. The primary reason for the migrations is the search for suitable food. Added stimulants may be the general unrest of the rutting activities in the fall and the physiological changes associated with fawning in the spring. In Canada, the general mass movement of caribou is from tundra to forest in the fall and early winter, and vice versa in the spring and early summer. In Alaska, there is a migration from highlands to lowlands in the fall and in the reverse direction in the spring. In Lapland, the domestic breed feels the urge to migrate in summer from inland to coast. Accordingly, the Laplander, with his herds, sojourns for several months in the neighborhood of the sea. In addition, there are many local movements of individual herds that do not conform to any over-all pattern. Segregation of the sexes has been noted in migrating herds of caribou. The does, accompanied by their yearling young, are in the advance. They are followed by young bucks, and old bucks bring up the rear.

HUNTED BY MAN AND WOLF

Human residents of the caribou range, who are in need of meat and hides, use their knowledge of routes taken by the animals for ambushing them. Eskimos have contrived ingenious devices for securing caribou. One of these is the building of a fence or a series of low mounds along each side of the route. The fences or mounds are usually convergent and may lead to a river crossing, a cliff, or a corral. Caribou on such a route may become suspicious but fear to crash through the fence or cross the mounds and thus are led into the trap or ambush.

Next to man, the wolf is the most important predator of the caribou. So close is the relationship between the two animals that predator and prey lead the same nomadic life. Bears sometimes secure calves for food but their depredations are insignificant. Wolverines and foxes frequently eat caribou meat but only as scavengers. The golden eagle occasionally kills a new-born or very young fawn. However, the most important natural factors in reducing the numbers of caribou are disease and parasites.

PREDISPOSED TO DOMESTICATION

The caribou is instinctively tame, sociable, of a docile disposition, and endowed with a high degree of curiosity. These qualities predispose it to domestication. No attempt was ever made to domesticate the American caribou, but its European and Asiatic relatives have long been completely subjected to man's domination. In Scandinavia, the reindeer supplies meat, milk, cheese, clothing, and means of transport in a climate where horse, cow, goat and sheep cannot be utilized. Harnessed to a sledge, the reindeer will travel 100 miles a day over the frozen snow. It is capable of drawing a weight of more than 300 pounds. The northern Asiatic breed is larger than the Lapland form and is used as a mount.

MAKING HER OWN FUR COAT

American husbands can envy the mate of this Eskimo woman scraping a caribou or reindeer hide. Many such hides are needed to make her clothing—two large or three small ones for the summer parka and twice as many for the winter double parka. The hides are used also for boots, mittens, blankets, tents, bow lines, fishing nets and snow shoes.

About 1840, the Hudson's Bay Company brought into Canada a few tame reindeer in charge of Norwegian herdsmen. The animals died within a few months. Reindeer of Siberian stock were successfully introduced into Alaska by the United States government in 1892 and during the course of the next eleven years. The original herds flourished and their descendants are numbered in the hundreds of thousands. The domestic reindeer are owned chiefly by Eskimos for whom they were originally imported, but white men have gradually acquired stock.

The Alaskan reindeer industry provides meat for residents and also for exportation. Reindeer or caribou hides are indispensable for the manufacture of many kinds of leather articles, for tents, and for the type of clothing needed by Eskimos. A fine twine is formed from reindeer gut and the bones serve to make various kinds of tools and primitive weapons. The bone also enters into the construction of sledges and other vehicles. Every part of the animal, except its grunt, is utilized and fact does not end with the fancy of a team of reindeer soaring through the air driven by Santa Claus in a sleigh replete with good things for all men.

Special Exhibit . . .

SOME FLOWERING TREES OF THE CARIBBEAN

Twenty-nine paintings in tempera of the brilliant flowering trees of the coastal shores and islands of the Caribbean will be shown in a special exhibit in Stanley Field Hall of the Museum through December. The paintings are by two young artists of New York, Bernard and Harriet Pertchik, who are husband and wife. They were commissioned in 1950 by the Alcoa Steamship Company to paint these pictures.

The Pertchiks first worked together as fellow students at Pratt Institute and later became well known for their talent in commercial art. The present collection, which has won admiration in art circles both in this country and abroad, is their first major work in the fine arts. Intended as an objective presentation of colorful and exotic flora, the series of paintings required much research at the source. To carry out the assignment, the artists visited many parts of the West Indies and South America and made extensive studies of growing trees. Although their paintings are restricted in conception by the bounds of botanical accuracy, the Pertchiks nevertheless utilized the unusual forms and brilliance of the tropical blossoms with creative ability of first order.

The paintings have been used to illustrate *Flowering Trees of the Caribbean*, an authoritative book on the most spectacular of the region's blooming trees published by Rinehart and Company under the sponsorship of the Alcoa Steamship Company. Some have also been reproduced in the magazine *Holiday*.

Among the plants depicted are both red and white frangipani, rose of Venezuela, Napoleon's button, algodoncillo of the mountain, cannon-ball tree, queen of flowers, wild chestnut, African tulip tree, yellow flamboyant, Long John, pride of Burma, shower of gold, madre de cacao, mountain immortelle, orchid tree, chinaberry, Geiger tree, and lignum vitae. Representatives of a number of these are among the exhibits in Martin A. and Carrie Ryerson Hall (Plant Life—Hall 29) and other botany halls of the Museum.

UNNATURAL WONDERS OF THE WORLD

By BARBARA POLIKOFF

Several years ago Karl P. Schmidt, Chief Curator of Zoology, was called upon by two Navy men who were offering for sale a "real" mermaid they had purchased while in Japan. Dr. Schmidt found that their specimen, like another he had seen, was not the work of nature but of a commercially minded individual who had sewn the tail of a fish to the torso of a monkey. Though the owners were reluctant to believe that they had purchased a fabricated phenomenon, their mermaid would have disappointed even the mildest of a sailor's expectations concerning the legendary beauty of these underwater damsels.

BEFORE

Guitar fish (Rhinobatos) in natural state. It is a kind of skate commonly found in shallow sandy places.

On another occasion some "dinosaur eggs" were offered to the Division of Paleontology. Upon due inspection they too were dismissed as being fake—dinosaur eggs were never known to be made of cement and to have a seam around the middle where the two halves of the mold had been joined.

This kind of "unnatural wonder" turns up at the Museum with enough frequency to give added weight to Dr. Schmidt's comment in the October, 1952, BULLETIN that "the accumulation of oddities and freaks is one of man's first responses to the collecting instinct." In our present age of commercialization some people have chosen to exploit this instinct by populating the world with a few more oddities and freaks, any of which can be purchased for a reasonable price.

The most recent of these concocted wonders brought to the Museum was found by Dr. Charles H. Seevers, Research Associate in the Division of Insects, as he was hunting through the mazes of an antique shop in Guadalajara, Mexico. Hanging in a corner of the shop among dusty vases, plaster wall plaques, and other unassorted items was what appeared to be a withered embryo of something that looked uncannily like a devil but which he recognized as a fish that had undergone some weird transformation. It had wings connected to what appeared to be arms; it had a waist and a neck and legs, as well as a properly speared tail.

This "devil fish," as he found it to be called, was priced at the bargain rate of 30 pesos, but Dr. Seevers managed to purchase it for 15. When he returned to the States he brought the "devil" to the Museum's Division of Fishes to find out exactly what kind of man-induced metamorphosis had transformed some innocent fish into such an underworld character. Loren P. Woods, Curator of Fishes, identified it as a kind of skate, a guitar fish (*Rhinobatos*) that is quite commonly found in warm oceans in shallow sandy places. The transformation of the fish was probably accomplished by cutting out the snout, leaving a notch, the ends of which were curled to form horns. The pectoral fins that are joined to the body were split to form arms and wings, the tail was cut into three portions to form two legs and a nicely speared "devil's" tail, and strings were tied around the body to form a neck and waist. To complete the transformation the jaws were pulled out and propped into a protruding sneer. And so, a devil fish—specially designed for the tourist who has not yet developed a searching eye or a healthy skepticism.

AFTER

Guitar fish transformed into "devil fish," an unnatural wonder specially designed for the tourist trade.

NATURE PHOTO EXHIBIT DEADLINE NEAR

Photographers, both amateur and professional, are reminded that the deadline for entries in the Ninth Chicago International Exhibition of Nature Photography is only a few weeks away. No photographs or color slides submitted after January 16 can be considered. The contest and exhibit are held under the joint auspices of the Chicago Nature Camera Club and Chicago Natural History Museum. Entries should be sent to the Museum, which on request will furnish forms and a complete outline of the conditions. The exhibition will be held at the Museum from February 1 to 28, and winners of awards will be announced just before that time.

The exhibition will be composed of two divisions: Prints and Transparencies. There will be three classifications in each division. They are: Animal Life, Plant Life, and General (scenery, geological formations, clouds, and other nature phenomena not included in the other two classifications). Silver medals and ribbons will be awarded in each print and slide classification, and the names of winners will be inscribed on the Myrtle R. Walgreen plaque.

Judges appointed for the contest are: Roland Eisenbeis, Senior Park Naturalist, Forest Preserve District, Illinois; Robert F. Inger, Assistant Curator of Fishes at the Museum; Rachel M. Osgood, photographer; Jack Remde, photographer; and Rupert L. Wenzel, Curator of Insects at the Museum.

Museum Staffers as Editors

Several members of the Museum staff serve on editorial boards of scientific journals. Dr. Theodor Just, Chief Curator of Botany, is editor of *Lloydia*, a biological journal, and of *Paleobotanical Report*, and one of the editors of *American Journal of Botany*. Dr. Rainer Zangerl, Curator of Fossil Reptiles, and Mrs. Priscilla F. Turnbull, Assistant, are editors of the *Society of Vertebrate Paleontology News Bulletin*. Dr. Karl P. Schmidt, Chief Curator of Zoology, is an editor of *Biological Abstracts*, of *Ecology*, and of *American Midland Naturalist*.

Restorations of southern white cedar and bald cypress have been added to Charles F. Millspaugh Hall of North American Trees (Hall 26).

BIRDS IN GILDED CAGES RUN AFOUL OF THE LAW

She's only a bird in a gilded cage,
A beautiful sight to see,
You may think she's happy and free from care.
She's not, though she seems to be—
'Tis sad when you think of her wasted life,
For youth cannot mate with age,
And her beauty was sold
For an old man's gold,
She's a bird in a gilded cage.

(Song by Arthur J. Lamb and Harry Von Tilzer. Copyright 1900 by Shapiro, Bernstein & Von Tilzer. Renewed 1927 by Harry Von Tilzer Music Publishing Co. Used by permission.)

By AUSTIN L. RAND
CURATOR OF BIRDS

WHO would have thought this song of the 1900's would be having a temporary renewed popularity today in the bird division of the Museum? It came about through the Museum's being asked by the United States Customs in Chicago to identify feathers of imported birds in gilded cages. Our first glimpse of them brought the words of the old song to mind.

At first there was a temptation to write an account of the whole affair with the chorus of the song as a text.

How well the "A beautiful sight to see" fits the bird.

"Her beauty . . . sold . . . for gold"—this could be tied in with the ruinous part that commercialism plays when it touches wild life.

". . . her wasted life"—being here the living bird reduced to a bundle of feathers for the trade. And further, the brilliant feathers decorating this ornate gaud, being from wild birds, are contraband, so that the whole is seized by the customs, and the time, trouble, and money of the people making the importations are all wasted.

A professional spellbinder, with a quaver in his voice, should be able to do wonders with this, if he did not descend into melodrama that became bathos and consequently ludicrous.

MORE THAN EMOTION INVOLVED

But sound conservation and bird protection should be based on more than playing on people's emotions. Naturally in something as complex as managing renewable natural resources, ideas as to what and how, as well as why, will vary. But emotional content will not help sober judgment. The factual account that follows seems the best presentation.

Mechanical singing birds in gilded cages are making an ill-omened attempt at a comeback. The bird is an artificial one, covered with natural feathers and fitted so that when the music box, concealed in the bottom of the cage, plays its spirited whistled song, the bird opens and shuts its mouth and moves its wings and tail. The result is intriguingly realistic.

SEIZED AS CONTRABAND

Two of the mechanical birds in gilded cages brought to the Museum by the U. S. Customs Service for identification of the feathers. The importation of feathers of wild birds is prohibited, so these curios were confiscated.

These birds were common as parlor ornaments a generation or so ago. Now, with a renewed interest in modes once considered merely old-fashioned, they are being put on the market, with Germany the main source of supply. In the past few months I've seen a dozen or so, brought to the Museum by customs officers who asked me to tell them what kind of feathers are on them.

Unfortunately, these birds are mostly covered with the feathers of wild birds, and the importation of any wild-bird plumage into the United States is prohibited. Hummingbirds, tanagers, honey creepers, and ground sparrows' feathers from tropical America are among those I've identified on these birds. One large cage, with three birds in it, had a letter from the exporter saying that the feathers used were those of domestic birds (which could be legally imported), but at a glance I saw all three were common South American species and showed the customs man specimens of the kinds that had been used. The cage and its birds, of course, had to be confiscated.

In the latter part of the last century and the first part of this, the feather trade reached enormous proportions. From the tropics and subtropics around the globe, feathers from birds ranging in size from hummingbirds to rheas were shipped to the world feather-markets.

A few figures from Henderson's *The Practical Value of Birds* are impressive: 3,000 skins of hummingbirds were included in one shipment from Brazil in 1888; 400,000 skins, mostly hummingbirds, were sold at auction in London in one week in 1888; and 41,090 hummingbirds were sold in three sales in London in 1911.

FORMERLY USED IN MILLINERY

The use of these feathers was mostly in millinery. A reaction set in in Europe and the United States. In 1913 a law was passed prohibiting the importation of wild-bird feathers into the United States. The decline of the feather market began. Lots offered for sale in the feather markets began to be withdrawn for lack of buyers or prices. I've heard it said that some companies still have big stores of feathers. Apparently there is the hope that fashion and laws will change and allow them to be marketed. Every now and then one sees a hat with contraband bird plumes in a millinery window. The mechanical birds seem to be another attempt to use stored feathers.

Commercialism is the worst enemy of wildlife. Fortunately our safeguards against the resumption of the feather trade seem adequate, and our alert customs department is seeing that the safeguards work! And the Museum is co-operating in helping identify the feathers.

Traveling Exhibits for Schools

During the school year the N. W. Harris Public School Extension of the Museum keeps more than 1,000 traveling exhibits in circulation among 510 public, parochial, and private schools. No other city has a service comparable in scope to that made available by this Museum to Chicago schools.

Much valuable assistance in the work of the Museum is given by a corps of volunteer workers who aid members of the regular scientific staff.

HOW TINY AREA'S CROPS COULD FEED WORLD

By FRANCIS DROUET
CURATOR OF THE CRYPTOGAMIC HERBARIUM

IN THESE DAYS when vegetables are grown in vats of water and dissolved chemicals, scientists are dreaming of providing more and more food in less and less space for the expanding population of the world. Their dreams include two projects involving algae. One of these is to harvest and prepare for consumption the great fields of seaweeds that inhabit the shallower waters of the ocean. The other (as was mentioned in the BULLETIN for September, 1953) is to produce marketable quantities of edible unicellular algae in a manner similar to that in which vegetables are often grown today.

Seaweeds, along with rice and fish, have always constituted the national diet of the Japanese. Species of Porphyra, Gelidium, Laminaria, and many other genera—six or more different kinds during the course of a single meal—are eaten fresh or dried or cooked in various ways. Cultivation of these algae in sea-gardens is one of the major industries of Japan. To a lesser extent the Chinese use seaweeds in their cuisine. These same algae, largely from Japan, are offered under trade names at the so-called "health-food" stores in Chicago. Several companies in the United States process and market these products and maintain laboratories for developing further uses for them as food for humans and livestock. The seaweeds consist principally of carbohydrates and proteins; they are claimed to be rich sources of assimilable iodine and vitamins.

IRISH MOSS WIDELY USED

The chief seaweed used as food in Europe and the United States is the Irish moss, *Chondrus crispus*, harvested on the coasts of northeastern North America, the British Isles, and northern Europe. It is a constituent of many jellies and puddings; but it is more familiar to us as a common ingredient of soaps, hand lotions, and paints and as sizing for cloth and paper. In some parts of Europe, Porphyra (laver) is used for making soups, and at least formerly this and *Ulva Lactuca* (sea lettuce) were used as salads. The dried fronds of *Rhodymenia palmata* are still eaten raw or cooked in many parts of Europe and in eastern North America—here they are known by the Scottish name *dulse*.

Agar, a purified jelly-like substance prepared by boiling various species of Gelidium, Gracilaria, Eucheuma, etc., is an ingredient of soups and desserts in Japan. In this country and Europe it has wide use in the manufacture of ice cream, candy, and pastry and in the canning of soft fish. Formerly the preparation of agar was almost a monopoly of the Japanese; but during and since World War II, because of its extensive employment in bacteriological laboratories, considerable agar has been manufactured in this country from local species.

In several parts of the world, fresh-water algae are eaten by man. Two species of Nostoc are used by the Chinese in cooking, and *Gloeocystis Grevillei* is mixed and drunk with coconut milk by the Gilbert islanders. It is probable that many species of fresh-water algae are edible, although those that form water-blooms are said to be toxic to livestock.

MARINE TRUCK GARDENS

Undoubtedly the thousands of tons of seaweeds now going to waste (or used only in small quantities as agricultural fertilizers) along rocky coasts throughout the world could be counted upon in the future as a source of staple food for man and beast as is now the case in Japan. Even as there, the more desirable species could be cultivated in marine truck-gardens. Estimates have been made that more than 400 species can be eaten.

The idea of growing unicellular fresh-water algae in quantities suitable for food is of recent development. Among more than a hundred species of green algae now being studied, strains that contain protein up to one-half of their dry weight have been discovered. With these could be produced in an infinitesimal space the quantities of food now requiring acres of ground for the production of vegetables and livestock. It is claimed that a quantity of *Chlorella pyrenoidosa* sufficient to feed half the human race could be grown in a space equivalent to the state of Rhode Island. Chlorella can be cultivated in solutions of flowing chemical nutrients in glass or plastic tubes or tanks that require little care after the apparatus has been set up. At the present stage of development, the process is slightly more expensive than is economically feasible, but industrial engineers can perhaps reduce these costs. Dried Chlorella is said to taste very much like raw lima beans or pumpkin, and culinary artists should have no difficulty in transforming it into palatable dishes. For livestock, it should readily take the place of alfalfa.

Various seaweeds and microscopic algae are on exhibition in the northeast corner of Martin A. and Carrie Ryerson Hall (Plant Life—Hall 29).

Library Serves More People

The Museum Library, although primarily organized to serve the needs of the staff, reports ever-increasing use for reference by outsiders. The public is always welcome, and last year 2,585 of the 130,000 volumes on the Library shelves were consulted by nonmembers of the staff.

The story of American Indians over a period of some 20,000 years is unfolded by exhibits in Raymond Hall (Hall 4).

MUSEUM STAFF WELCOMES 4-H BOYS AND GIRLS

Boys and girls of the nation's farms—more than 1,300 of them, selected for merit and achievement—will visit the Museum on December 1. Their visit, a custom of many years' standing, is arranged by the National Congress of 4-H Clubs, which brings them to Chicago at the time of the annual International Livestock Exposition. There will be delegates from nearly every state and from the provinces of Canada. All of the young visitors will be conducted on tours of exhibits. Some groups will be guided by staff lecturers of the James Nelson and Anna Louise Raymond Foundation for Public School and Children's Lectures, others by members of the scientific staff from the four departments of the Museum.

STAFF NOTES

Dr. Karl P. Schmidt, Chief Curator of Zoology, has been elected president for 1954 of the Society for the Study of Evolution and **Dr. Theodor Just,** Chief Curator of Botany, has been elected vice-president. Dr. Schmidt had served as first treasurer and business manager of the society for over five years. Dr. Just recently attended a meeting of the Divisional Committee for Biological and Medical Sciences of the National Science Foundation in Washington, D.C. . . . **Dr. Sharat K. Roy,** Chief Curator of Geology, **Dr. Rainer Zangerl,** Curator of Fossil Reptiles, **Bryan Patterson,** Curator of Fossil Mammals, and **Robert K. Wyant,** Curator of Economic Geology, attended the meetings last month in Toronto of the Geological Society of America . . . . **Donald Collier,** Curator of South American Ethnology and Archaeology, gave an illustrated lecture on Peruvian archaeology before last month's meeting in Downers Grove of the Earth Science Club of Northern Illinois . . . . **Lawrence Kaplan** has been appointed Chicago Natural History Museum Fellow in Botany by the University of Chicago . . . . **Rupert L. Wenzel,** Curator of Insects, is engaged in studies on typical material of beetles of the family Histeridae, on which he specializes, in the collections of the United States National Museum, Washington, D.C., and the Museum of Comparative Zoology at Harvard University.

North American Trees

A number of reproductions of leafy tree branches have been added to the exhibits in Charles F. Millspaugh Hall of North American Trees (Hall 26). Among them are blue ash, black locust, sycamore, American holly, bitternut, red maple, dogwood, and paper birch.

DALLWIG SUNDAY TALKS BEGIN IN JANUARY

Paul G. Dallwig, the Layman Lecturer, will open his fourteenth season of Sunday afternoon dramatized talks on scientific subjects in the Museum on the first Sunday in January. Offering a different subject each month, he will lecture each Sunday through May (lectures will be omitted on two Sundays—April 18, Easter Sunday, and May 30, Memorial Day).

The first lecture, to be presented at 2 P.M. on January 3, 10, 17, 24, and 31, will be "A Trip to the Moon—Why Not?" In this lecture Mr. Dallwig will explain the difference between comets, meteors, and meteorites and discuss flying saucers and disks pro and con. Principal feature will be a description of an exciting trip to the moon in accordance with the indications of scientific knowledge as to what might be expected on such a journey.

On Sundays in February Mr. Dallwig's topic will be "Life—What Is It"; in March, "Behind the Scenes in Our Museums"; in April, "Nature's 'March of Time'"; and in May, "The Romantic Story of the Diamond."

Museum Members are admitted to these lectures upon presentation of their membership cards; others must make reservations in advance by mail or telephone (WAbash 2-9410). Halfway through the lecture, at 3 P.M., is a half-hour intermission for refreshments in the Museum cafeteria. Lectures begin in the Lecture Hall and progress into exhibition halls containing material illustrating Mr. Dallwig's subjects.

NEW MEMBERS

The following persons became Museum Members from October 16 to November 13:

Non-Resident Life Member

Dwight Shirey

Associate Members

Herbert J. Clonick, George L. Hunt, Mrs. Carolyn D. Manz, William L. McLennan

Annual Members

William S. Allmart, Dr. Albert J. Chesrow, J. B. Cleaver, T. R. Coffin, Thomas N. Cummings, Clyde F. DeWitt, Mrs. Millington Domville, Miss Johanna C. Glaman, Leslie S. Gordon, Daggett Harvey, Robert L. Heath, Miss Louise Hillmer, Charles H. Hobbs, Bailey K. Howard, Joseph C. Hyatt, David S. Jennings, Kenneth J. Kimball, Bernard Kovnat, Leonard Krimsin, Mrs. Milton L. Laing, Charles Lazar, J. L. McManus, H. Earle Muzzi, Warren K. Parent, L. T. Pelnar, Walter B. Ratner, Dr. Howard A. Raubitschek, Mrs. Arthur C. Romer, Orion L. Rose, Julius Samuels, Richard L. Samuels, N. J. Sell, C. D. Smith, Edmund A. Stephan, Selwyn H. Torff, Daniel A. Uretz

The Museum's Division of Photography now has more than 110,000 negatives on file.

CHRISTMAS SHOPPING THE EASIEST WAY— MUSEUM HANDLES THE DETAILS FOR YOU

Chicago Natural History Museum offers two special services that can save you time and money in your Christmas shopping. You can do your shopping sitting comfortably at home, and you don't have to wrap a package. Here's how to buy and send your gifts in the easiest way:

(1) Christmas Gift Memberships

Send to the Director the name and address of the person to whom you wish to give a Museum membership, together with your remittance to cover membership fee (see enclosed Christmas gift membership order form).

An attractive Christmas card will notify the recipient that through your generosity he has been elected a Member of the Museum. He will receive also his membership card and information on membership privileges.

(2) Museum Book Shop Gifts

Books endorsed for scientific authenticity by members of the Museum staff are on sale in the BOOK SHOP. The selection is for both adults and children.

When desired, the BOOK SHOP will handle orders by mail and telephone (WAbash 2-9410). It will undertake all details of wrapping and dispatching gift purchases to the designated recipients, together with such personal greetings as the purchaser may specify, charging only postal costs.

GIFTS TO THE MUSEUM

Following is a list of the principal gifts received during the past month:

Department of Anthropology:

From: Rose J. Watson, Oak Park, Ill.—mementoes of Dr. George A. Dorsey

Department of Botany:

Holly R. Bennett, Chicago—210 miscellaneous phanerogams, Chicago; University of California, Berkeley, Calif.—26 phanerogams, El Salvador; Dr. Henry Field, Coconut Grove, Fla.—28 ferns, 44 fungi and algae, Florida; Dr. Alice L. Kibbe, Carthage, Ill.—H. N. Patterson's botanical correspondence; Dr. E. P. Killip, Washington, D.C.—124 miscellaneous phanerogams, Florida; School of Forestry, New Haven, Conn.— 52 phanerogams, Central and South America; Floyd A. Swink, Chicago—147 phanerogams, Illinois; John W. Thieret, Chicago—2 phanerogams, Indiana

Department of Geology:

Ernest Delco, Michigan City, Ind.—*Mastodon americanus*, Indiana; G. E. Lindberg, Chicago—*Calymene niagarensis*, Chicago; William E. Schwerdtfager, Rock Falls, Ill.—shark and plesiosaur teeth, Kansas

Department of Zoology:

From: J. R. Hendrickson, University of Malaya, Singapore—22 snakes; Harry Hoogstraal, Cairo, Egypt—38 ticks, Madagascar; Robert Howell, Norfolk, Va.—pulmonate shells, Virginia; Dr. Keith R. Kelson, Lawrence, Kan.—2 bats, Japan; N. L. H. Krauss, Belize, British Honduras—2 frogs, a lizard, a snake, Central and South America; Lincoln Park Zoo, Chicago—a rattlesnake, New Mexico; E. H. McEwen, Aklavik, N. W. T., Canada—9 frogs, Canada; P. W. Millar, Fort Lauderdale, Fla.—a scarab beetle, Florida; Dr. José Luis Minoprio, Mendoza, Argentina—a mammal specimen, Venezuela; Lars H. Sjodahl, Chicago—2 moths, Chicago; Ross Tarrant, Lake Geneva, Wis.—7 lots of preserved fishes, Florida; U. S. Fish and Wildlife Service, Pascagoula, Miss.—6 lots of deepwater sharks, 23 lots of fishes, Gulf of Mexico; Walter F. Webb, St. Petersburg, Fla.—4 lots of land shells, worldwide; Dr. F. Medem, Bogotá, Colombia—23 mammals, Amazon region of Colombia; Dr. Charles H. Seevers, Chicago—worm snake, Mexico; Bernard Benesh, Burrville, Tenn.—2 lizards, a snake, Tennessee; Dr. Edwin V. Komarek, Thomasville, Ga.—10 bats, Georgia; Dr. Hobart M. Smith, Urbana, Ill.—lizard, Mexico; Biologic-Pedagogic Institute, Tel Aviv, Israel—birdskin, Israel; Dr. Ellen Calvary, Chicago—land snail, Montana; Lewis E. Long, Washington, D.C.—mollusks, crabs, leeches, flatworms, frogs, lizards, snakes, mammals, Brazil; the late Mrs. Davis P. Moreton, Wilmette, Ill.—collection of sea shells, worldwide; Dr. Robert Rausch, Anchorage, Alaska—5 bats, a bear skull, Alaska; Dr. Jeanne S. Schwengel, Scarsdale, N.Y.—collection of non-marine shells, worldwide; Ross Tarrant, Lake Geneva, Wis.—preserved fishes, Wisconsin; U. S. Fish and Wildlife Service, Pascagoula, Miss.—preserved fishes, Gulf of Mexico; Mrs. James Van Trump, Pavillion, Wyo.—fairy shrimps, Wyoming; Zoological Society of London—mammal specimen, British Somaliland, and 5 lizards, 2 turtles, Africa

Raymond Foundation:

From: Clarence B. Mitchell, Chicago—43 color slides

Museum Will Be Closed On Two Holidays

On Christmas and New Year's Day the Museum will be closed so that its employees may spend the holidays with their families. These are the only days in the year when the Museum is not open to visitors.

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